

BS 2019: LARGEST EVER Building Simulation conference



912 delegates 5 plenary sessions 130 technical sessions 47 case studies sessions 8 panel discussions 660 research papers

(and lots of lively conversation, music, food, and wine)

FEATURES & INTERVIEWS	features on Model Predictive Control and IBPSA-USA's 'Ask a Modeler' advice column
SOFTWARE NEWS	about Climate.OneBuilding.Org, MIT's new Urban Modeling Interface plugin, a major update to Modelica, new modelling guides and standards from ASHRAE and the AIA, and more
GLOBAL COMMUNITY NEWS	from IBPSA affiliates in Argentina, India, Mexico, the Nordic countries, Singapore & Switzerland
CALENDAR OF EVENTS	14 conferences and other events for your diary

The newsletter of the International Building Performance Simulation Association

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Did you know

that the page layout and typography of ibpsaNEWS have been specifically designed for reading on-screen ever since volume 10 in 1999, and all the items in contents lists, and web and email addresses, are active links? Try it on your tablet! - Editor



The International Building Performance Simulation Association exists to advance and promote the science of building performance simulation in order to improve the design, construction, operation and maintenance of new and existing buildings worldwide.

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President's message

Dear IBPSA Colleagues and Friends,

I would like to take this opportunity to thank IBPSA Italy, the IBPSA Conference Committee and all of those who were responsible for the delivery of Building Simulation 2019 in Rome – the conference was a great success. I hope that those of you who were able to attend appreciated the experience as much as I did; I'm sure that you will agree that the backdrop of Rome and the venue itself were nothing short of spectacular. For those who did not manage to attend, once you have read the reports elsewhere in this edition of *ibpsa*NEWS, perhaps you will be enthused to make a point of attending the next IBPSA conference.

This conference marked a number of 'firsts' for IBPSA: we had over 1000 attendees from 45 countries, 10 parallel sessions and a packed programme with five keynote speeches and more than 100 technical sessions with a record number of papers – including short papers introducing posters as well as the more traditional longer papers – and a number of parallel activities such as committee and project meetings, workshops, panel sessions, awards presentations, competition results, sponsor and vendor exhibits, receptions, a concert and conference banquet. Everything ran smoothly, assisted by the communication of last minute changes and opportunistic activities communicated by the conference APP – a feature first introduced in San Francisco in 2017. I would also like to take this opportunity to thank those organisations who sponsored the conference or supported in other ways.

It could be argued that we are at risk of becoming victims of our own success, as it is becoming difficult for us to grow further without impacting on the quality of the conference experience. The Board recognises this and we have discussed the risks and possible solutions to over-stretching ourselves. We have loads of ideas to take forward following the post conference Board Meeting but it's also important to keep up the momentum we have begun to generate over the last few years, especially around the nature of IBPSA going forward and consolidating our membership structure in order to simplify our lines of communication and grow our income stream. Please don't forget to consider becoming a Supporting Member!

We think of IBPSA as a unique community with shared goals and ideas embedded in improving lives through better buildings and places, and the event last week was a perfect example of what IBPSA is all about, with a large part of the conference dedicated to simulation of the Urban Environment. Every IBPSA Conference is different, from the range of content to the idiosyncrasies of the venues and we would not have it any other way. Like all of the preceding IBPSA Conferences, BS2019 provided a great opportunity to learn new things, visit new places, meet old friends and make new friends. I came away feeling enriched in many ways.

President's message



Building on work started at BS2017, we continue our discussions on membership development and inclusivity – and we are actively focused on changing what we do to appeal more to younger people rather than trying to get them involved in our traditional activities. Our discussions about bringing new people into the field, equality issues, mentoring, and expanding international collaboration have led to thoughts around extending our Education and Futures activities to an IBPSA Summer School Programme, happening at different times of the year in different places as a way of sharing knowledge and new ideas. So please watch this space if you would like to get involved or contribute in other ways.

As ever in our 'non-conference year', 2020 will be a year of regional conferences, including eSim, SimBuild, BauSIM, BSO, USim and ASim. Please take advantage of ibpsaNEWS to advertise local activities and support your regional affiliate by taking part in local events. As usual, the papers from regional conferences will be available through www.ibpsa.org, so your work will benefit from worldwide visibility.

holi B

Best of 'Ask a Modeler': Evolving careers and talking about uncertainty

This year, the IBPSA-USA Research Committee created 'Ask a Modeler', a monthly advice column for the building simulation community. Each month, committee chair Nathaniel Jones and members of the Emerging Simulation Technology subcommittee pose a question submitted by an IBPSA member to recognized experts to get their unique perspectives. Through this column, we hope to expand communication and create a sense of community among practitioners, researchers, and academics at all points in their building simulation careers. Below, we are reprinting some expert advice from the past few months. We hope that sharing these questions and insights will bring value to your work and possibly make you think about building performance modeling from a new point of view.

What do you expect for the growth of energy modeling careers in the next few decades? Or, how will energy modelers evolve, career wise, especially when energy efficiency is fading, potentially less demanding policy asking for energy modeling, and renewable energy approaches 100% of source energy? — Wondering Bud

Dear Wondering Bud,

I'm *reasonably* certain that we'll continue to have buildings in the next few decades -- and if we don't, the future of energy modeling careers probably won't be our top concern.

Given that, people will continue to want to know how buildings will perform and they'll look to you to help advise. But, the metrics by which we judge a "good" building and a "bad" one may shift. At a fundamental level, our task is to help make technical decisions based on limited resources; moving forward this may not be focused on energy.

We should stop thinking of it as energy modeling, and start thinking of it as building performance prediction. Any way you look at it, there are a lot of interesting pivots coming up.



We're beginning to see a shift from energy-based goals to ones centered on GHG reduction, grid harmonization, and resiliency. Today's high performance buildings have deep energy efficiency and advanced controls, often with renewables. With our shifting focus, these will still be valuable, but the specific technologies and optimal control strategies may differ. In a similar vein, your energy efficiency expertise will also be a critical foundation to build on. Performance modeling goes beyond efficiency; the same modeling know-how can be applied to optimize for new metrics and to characterize technologies and control strategies in a different modeling environment.

So, how do we evolve? Research is needed to understand where future-looking decisions will differ from today's, such as choices related to metrics, fuel choice, operational strategies, and loading order. (Bonus, this

is an excuse to learn!) We expect to see a deeper emphasis on load management and we'll need to know more about grid interaction and neighborhood-scale planning. Building demand prediction, especially short-term (which is notoriously hard to nail down), will be critical as we move towards grid harmonization. We'll also continue to see a need for uncertainty analysis, particularly with the changing climate.

To stay up to date, the IBPSA-USA Education on Demand library (www.ibpsa.us/video-authors/aaronboranian) is a great place to start. As a member, you can stream to your heart's content. Our annual conferences are also a rich resource, both for technical content and to have the chance to catch up with all of your modeling friends. BS 2019 was in Rome this month and the ASHRAE/IBPSA-USA BPAC and SimBuild 2020 (www.ashrae.org/conferences/topical-conferences/2020-building-performance-analysisconference-simbuild) will be in Chicago next August. The call for paper abstracts has closed, but we'll be seeking presentation-only proposals early next year. Yours truly is chairing and our very own Supriya Goel is the Scientific Committee Chair. We'll be focusing on carbon reductions, along with all of the usual nitty gritty topics (of course).

Carrie Brown, PhD IBPSA-USA Vice President Senior Technical Consultant, Resource Refocus LLC

How can I talk to clients about the uncertainty in models? I recently had a client who wanted to find the lowest cost solution of several design options. Some of the options performed very similarly, probably within the simulation's margin of error. I want to explain to clients like this that I can't guarantee one "best" option, but I don't want to sound like I lack confidence in my models.

— Uncertain in Urbana

My first instinct is to recommend that you bang loudly on your client's desk while shouting the aphorism (generally attributed to the statistician George Box), 'ALL MODELS ARE WRONG BUT SOME ARE USEFUL!!!!! ALL MODELS ARE WRONG BUT SOME ARE USEFUL!!!!'

In case this approach is a bit heavy-handed, here are some practical suggestions to help bridge the modeling gap and help your client have more faith in the uncertain world of energy simulations:

Know your client

This might seem obvious, but it's important to be aware of your client's areas of technical acumen. Are they well-versed in HVAC or are they coming from more of a

financial background? How interested are they really in digging into an energy model's minutiae? The answer might surprise you.

Knowing how to read the room is essential; just as it's important not to be overly-technical when communicating modeled results, it's also important not to sound like you're being dismissive of what could be a well-informed concern.



Consider using ranges for reported results

An ECM table that shows savings of \$565, \$823, \$592, and \$763 per year is probably too granular for a mid-to-large-size building. In cases of small relative savings, a range of 500 - 1,000 (or even establishing a lower boundary like < 2,000) might be more appropriate.

By presenting savings as appropriately-binned ranges or thresholds, you'll bring the inherent uncertainty of modeling into focus, and you'll also save your client the eye-strain of parsing through a sea of insignificant single-digit values.

Don't blame everything on uncertainty (aka: "maybe you just screwed up")

Woe betide the modeler who fell back on the nebulous "statistical uncertainty" excuse when their plant reports showed a chiller peaking at a COP of 42 because of a condenser water controls typo, and their client noticed it before they did.

We're all used to seeing counterintuitive results, but there's a big difference between counterintuitive and physically impossible. If your client trusts that you'll own up to a fat-finger mistake rather than muddying the waters with implausible jargon, they'll be more likely to trust you when you make an articulate case for a truly unanticipated (and potentially informative) result.

When all else fails: Don't be afraid to get wonky

Sometimes, the best answer might just be to actually talk to them about uncertainty.

It's probably not a great idea to kick off a design charrette with a dissertation on sensitivity studies and ASHRAE Standard 140, but it doesn't hurt to have some higher-level technical literacy in your back pocket if you're really getting pressed on your results. Talk to your client about variation in weather files or unpredictable infiltration rates, day-two occupancy changes or altered controls sequences. Talk to them about whatever you need to in order to help them understand that you're working with a model—and that no model will perfectly represent reality. But if you've done your job, it will at least be useful.

Michael Sweeney, BEMP, LEED AP Energy Engineer, AKF Engineers LLP

We want to hear your interesting, entertaining, or just plain odd questions about life and building performance simulation. Submit your questions via https://forms.gle/dsLikzVdt4SoAK849 to be answered by prominent building performance simulation experts. Note that questions requiring an immediate response should be submitted to the community of experts at http://unmethours.com. If you are interested in replying to a question as a featured expert or have any other feedback about Ask a Modeler please email askamodeler@ibpsa.us.

Model Predictive Control Bridging gaps for commercial deployment in buildings

Filip Jorissen (correspondent author, filip.jorissen@kuleuven.be), Damien Picard, Wim Boydens, Lieve Helsen (KU Leuven)

The world is becoming digitized with IoT devices and AI appearing everywhere, buildings included. Consequently, 'smart buildings' pop up everywhere, claiming improved integration, comfort and energy efficiency. Nonetheless, a large potential with respect to the control of HVAC stays untouched. For many years, academic research has developed advanced HVAC control methodologies such as Model Predictive Control (MPC). Using simulations, energy use reductions of more than 20% are usually reported, while these numbers are even rising now that buildings are becoming increasingly complex and better insulated. Even though real demonstration buildings report similar energy savings, and a handful of companies even offer various implementations of MPC, market adoption stays limited.

Introduction to MPC

Just like current practice, Rule based Control (RBC), an MPC is developed for a specific building only, it is tailor-made. More specifically, each MPC uses a mathematical model of the building, which is used to simulate its behavior — that is, the building response (temperatures, energy use, ...) to a change in control variables is computed and forecasted a few days ahead of time. A distinction is made between MPC types based on how the model is created. The *black-box* approach uses building measurement data and algorithms such as machine learning to train a model. The other extreme is *white-box* MPC, which uses physical principles, building geometry, thermal properties and HVAC data sheets to develop the model instead of measurement data. *Grey-box* MPC is a hybrid of the two approaches. Further distinctions are made based on the resolution of the model, and the support for non-linear equations, which are often simplified.

The resulting control approach is fundamentally different from RBC. For RBC, the controller developer implements control rules, such as a heating curve and PI controller, which tell the controller *what control actions to take*. For MPC, the controller developer implements a model, which tells the controller *how the system works*. The controller uses this model to compute what control actions to take. To obtain a well-performing RBC, the controller developer must identify appropriate control rules and must set good parameter values for e.g. the heating curve slope and offset. For MPC, the developer *merely* has to develop a model.





Challenges for market adoption

This model development however requires a substantial engineering effort, which should not be overlooked. Black-box MPC requires qualitative measurement data which is not trivial to obtain and often requires expert knowledge to assess the model quality. White-box MPC requires knowledge about numerical modelling, building physics and mechanical engineering. It is therefore not realistic to assume that we can train sufficient engineers or technicians to implement MPC at scale using the existing workflows.

Toolchain for Automated Control and Optimization

This was the motivation of the Thermal Systems Simulation (The SySi) research group at KU Leuven to develop TACO, a Toolchain for Automated Control and Optimization [1]. The goal of TACO is to significantly reduce the engineering effort required for developing MPC. Many MPC approaches aggregate multiple HVAC components or rooms into one, requiring the controller developer to assess what aggregation to make. Afterwards, the MPC control signals have to be disaggregated, again requiring expert knowledge. We use a detailed, white-box approach that is more intuitive, where each physical component (e.g. a pump, window) is mapped into a model counterpart. A library of reusable component models has been developed such that the controller developer does not need to be worried about the relevant physical principles for modeling these components, but merely about the interconnections and some technical properties of the components. The library components are available in the Modelica IDEAS library [2], which results from the joint collaboration of IBPSA Project 1 (there is an update on this project in the next feature in this *ibpsa*NEWS). TACO automatically translates the resulting object-oriented Modelica model into an MPC.



A building model is automatically mapped into an MPC executable that computes the optimal control set points based on measurements and forecasts

The approach is illustrated in the next figure. All indicated icons are reusable components, available in the open source Modelica IDEAS library. In the left of the figure, a zone is illustrated with 1 window, 4 outer walls and a floor. The floor contains a floor heating system, which is connected to a geothermal heat pump using two pumps and a three-way valve. The pump speeds, valve position and heat pump supply temperature set points are optimized each individually. Note that other MPC approaches would typically optimize the heat flow rate (or supply temperature) that enters the floor. Since the heating system is then not modelled, its influence on the efficiency is not considered and therefore that optimization potential is wasted. Furthermore, the optimal heat flow rate (or supply temperature) has to be tracked by some other control system, typically an RBC, which may again be badly tuned, or the MPC set point may not even be achievable depending on the modelling simplifications that were used.



Scaling up

The TACO approach has been compared to a detailed RBC implementation for a 10,000m² office building in Luxembourg with 92 individual control variables (VAV/valve positions, pump speeds, heat pump temperatures, AHU active/passive cooling, etc.). Simulations project more than 50% electrical energy savings. For more details see [3].

Within the EU-H2020 hybridGEOTABS project multiple demonstration buildings are planned of which the first is now operational. The Fluvius/Boydens building is a 3000 m2 office building in Brussels that uses concrete core activation for primary cooling and heating of the building. A geothermal borefield is used to passively cool the building while two geothermal heat pumps are used to heat the building. A 10 000 m3/h heat recovering AHU with heating and cooling coil, and 15 VAVs with 21 heating coils supply fresh air to the building. An MPC with 27 zones has been developed that has 49 control variables. The MPC is updated every 15 minutes and the forecast horizon is 3 days. The MPC has been operational since May 2019.



The Fluvius/Boydens office building in Brussels, Belgium. Source: Boydens engineering

During this period, the average HVAC electrical energy use per day has been reduced by 25% compared to a period with similar outdoor temperatures controlled by RBC in 2018. Electrical energy use reductions of more than 50% are observed for the AHU. These are caused by the improved coordination between the concrete core activation and the ventilation system, which lowers the cooling and heating loads of the ventilation system and significantly reduces the required air flow rates and fan speed.

These are still preliminary results since best practices for modelling the components are still being developed. Furthermore, the MPC operation is still constrained since we have to interface with the existing RBC, which limits the control options. One notable example is where MPC tries to use the heating system components for recovering heat: at times where a simultaneous heating and cooling load exists for different zones, MPC suggests to use the concrete core activation slabs of relatively warm zones as a heat source for pre-heating the supply air using the AHU heating coil, by circulating water between these systems through the common warm water collector. While such control actions may not be new for some, MPC has the potential to automatically apply them when appropriate without needing complex control rules.

Outlook

While these first results are promising, our approach requires further automation to become economically viable since the model development phase currently still requires too much forefront costs, manual work and expertise, that are not easy to integrate in the common design and building process. Workflows similar to Building Energy Simulation tools, however, show that more practical approaches are possible. Furthermore, when Building Information Modelling becomes sufficiently mature, fully automated model development workflows become achievable.

The main challenge then becomes how to position MPC in a quite complex market: who will make these controllers? While energy savings mostly have a financial benefit for the building owner or tenant (and the climate), reduced implementation, commissioning and maintenance costs can also be a huge benefit for engineering companies, control firms, maintenance companies, ESCO's, etc. The authors are currently working on the commercialization of MPC and the toolchain to efficiently develop such controllers with the ambition to have a commercial product by 2021. We welcome input from the IBPSA community that can help us take on this challenge. We are open for collaboration with researchers and interested industrial players.

Acknowledgements & References

We acknowledge the financial support of the European Union's Horizon 2020 research and innovation programme under grant agreement No 723649 (MPC-;GT), and of the VLAIO mandate of Filip Jorissen. This work depends on the IBPSA Project 1, an international project conducted under the umbrella of the International Building Performance Simulation Association (IBPSA). Project 1 will develop and demonstrate a BIM/GIS and Modelica Framework for building and community energy system design and operation.

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IBPSA Project 1

Update on open-source tool development for Model Predictive Control

Project overview

IBPSA Project 1 (https://ibpsa.github.io/project1) will create open-source software that builds the basis of next generation computing tools for the design and operation of building and district energy and control systems. It extends work conducted under the IEA EBC Annex 60 (www.iea-annex60.org). All work is open-source and built on three standards:

- IFC for data modeling at the building scale,
- CityGML for data modeling at the district scale, and
- Modelica for modeling the performance of building and district energy systems.

The project runs from summer 2017 to summer 2022. It coordinates and further develops the work of its more than 30 participating organizations. The project is developing in Task 1 a Modelica library for energy modeling, a Building Optimization Performance Test framework and a Modelica library for MPC. In Task 2, it is developing GIS/BIM data model to Modelica translators for individual building and community energy systems. Task 3 is developing a District Energy System Validation Suite and coordinates case studies.

This article describes the ongoing work on the Building Optimization Performance Test framework and the Modelica library for MPC that are being developed in Task 1 under the Work Package 1.2.

Advanced building HVAC control

Advanced Control Strategies (ACS) for HVAC in buildings have been researched for many years. This includes technologies such as Model Predictive Control (MPC) and a renewed interest in data-driven techniques due to the advent of artificial intelligence. In the literature, many different approaches are compared using simulation-based studies or measurements on test cells or actual buildings. However, more often than not, different examples and different performance indicators are used in these reports. This hampers the objective comparison of approaches and the identification of best practices. Furthermore, a lot of model development work is repeated, slowing down actual advances on MPC technologies.

The objective of Work Package 1.2 of the IBPSA Project 1 is to overcome these hurdles in three ways, by:

- developing a standardized test framework for objective comparison of ACS,
- developing a Modelica model library for use within a Model Predictive Controller, and
- testing different control approaches using this standardized test framework.

The Building Optimization Performance Test

The Building Optimization Performance Test (BOPTEST) is a computing environment that is being developed with the goal of testing ACS and objectively comparing ACS on a set of standardized test cases, as shown in Figure 1. The BOPTEST environment has been implemented such that predefined emulators can be used

Update on IBPSA Project 1: an open-source tool development for Model Predictive Control

to compute standardized key performance indices, allowing a comparison of different ACS on the same test setup. The simulations are being developed with sufficient level of physical detail and temporal resolution for simulating closed-loop control behavior. Furthermore, the framework will provide a library of emulators that can readily be used to test the performance of a controller across a set of buildings. To ensure transparency, all development is open source. The first version of BOPTEST has been implemented as is summarized below first from the user perspective and then from the developer perspective.





From the user perspective, BOPTEST is software that encapsulates the necessary functionality to control a virtual building, using a so-called emulator, and evaluate the performance of such control. A set of emulators for users to choose from is under development. They cover a range of complexities and system types, including single and multi-zone residences and offices with air- and water-based systems. To evaluate the performance of a controller, a set of key performance indicators (KPI) are automatically calculated based on data from these emulators. These KPIs include energy consumption, operating costs, CO2 emissions, thermal comfort, and computational time of the controller. The project team is working to develop other ways of evaluating a controller, such as cost savings relative to a baseline controller and projected installation costs and effort. Interaction with the emulator is done through a HTTP-based API. This API includes methods to view the available control inputs and measurement outputs from the emulator, choose a controller communication step size, overwrite control signals and setpoints in the emulator, advance time in the emulator, read measurement data, retrieve forecasts of weather, energy prices, and internal loads, and retrieve calculated KPI values.

From a developer perspective, the BOPTEST software is delivered using containerization with Docker. This allows for the exact specification and deployment of a light-weight virtual machine on almost any computing resource, whether it be locally or in the cloud, on Linux, MacOS or Windows. The Docker container uses Python to manage the simulation of the emulator, calculate KPIs, generate forecasts, and implement the HTTP-

based API. The set of emulators are written using Modelica and packaged as a Functional Mockup Unit (FMU) that contains all needed resources such as weather data, energy prices and schedules. A set of specialized Modelica blocks have been developed to aid in the overwriting of virtually any control signals within the emulator, either local actuator commands or supervisory setpoints, as well as identify sensor signals that are available to users as measurements. An FMU representing one of the virtual buildings, known as the test case FMU, is then used within the Docker container for testing. This approach ensures that consistent and sufficiently detailed results are obtained across different computing platforms. Furthermore, the controller can be implemented in any language as long as it can communicate through the HTTP-based API.

More details on BOPTEST can be found in the paper presented at Building Simulation 2019, and the development can be followed and joined at https://github.com/ibpsa/project1-boptest.

The IBPSA MPC library

IBPSA Project 1 will also develop a library of models for use within a Model Predictive Controller. This library, called IbpsaMpc Library, is implemented using Modelica, an equation-based, object-oriented modeling language that is extensively used in IBPSA Project 1 and well suited to formulated models for use within Model Predictive Control. Earlier collaboration efforts within the IEA EBC Annex 60 Project have focused on developing a joint library for simulation using Modelica models and have coordinated development efforts of four other Modelica libraries. WP 1.2 will now do a similar joint development for optimization applications, which requires models that have additional specific properties for use by optimization packages.

The development of this open-source IbpsaMpc library has recently started at https://github.com/ibpsa/ modelica-ibpsa-mpc. The developed models will automatically be tested using a custom unit testing framework that is tailored to optimization-oriented modeling.

Outlook

The next steps of Work Package 1.2 are focused on getting BOPTEST ready for initial tests of various MPC controllers from the participating institutions and continued development of the MPC library. One immediate task is the completion of an initial subset of virtual building emulators. New feature development and improvements to the BOPTEST software will be conducted as needed to begin this testing. The MPC library development will continue with the development of maintenance processes, implementation of a unit testing framework, and ultimately population of the library with component models.

Further information

For further information about the IBPSA Project 1 and how to join this joint collaboration, please visit https://ibpsa.github.io/project1, and see the preceding feature article about MPC in this *ibpsa*NEWS.

BS 2019 Notes from an impressive conference

Christina J Hopfe with information from Vincenzo Corrado and Andrea Gasparella, and with photographs from the conference organizers and Christina Hopfe

IBPSA's 16th International Conference and Exhibition was held at the Angelicum Pontifical University of St. Thomas Aquinas in Rome, Italy on 2 - 4 September 2019. A phenomenal 912 people attended, making it the Building Simulation conference with the highest attendance so far.

It also exceeded previous conferences in numbers of events and papers, with 5 plenary sessions (4 keynote speeches + 1 plenary panel), 130 technical sessions (7% panels, 6% case studies, 87% research papers), 47 case studies sessions, and 8 panel discussions. In total 660 research papers were presented, 461 with full oral presentations and 199 short oral presentations and poster presentation.

BS 2019 was hosted by IBPSA Italy. Established in 2011 and an active chapter with 170 members, IBPSA Italy has been running the yearly building simulation applications BSA conference since 2013.



The conference began with a welcome cocktail in the Angelicum courtyard on Sunday evening, accompanied by live music.

Day 1

The first full day opened with a welcome from the organisers Vincenzo Corrado (conference chair) and Andrea Gasparella (conference co-chair), with Francesco Asdrubali (secretary) providing information on the conference and the venue.

The welcome address was given by IBPSA's president Lori McElroy who introduced the organisation and its mission. Further presentations were given by invited representatives from the Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA), by REHVA vice president, Catalin Lungu; from the International Energy Agency's Energy in Buildings and Communities Programme (IEA EBC) Executive Committee Vice Chair Paul Ruyssevelt; the International Energy Agency's Solar Heating and Cooling Technology Collaboration Programme (IEA SHC TCP) and TCP Ex Committee member Alessandra Scognamiglio.

To attract the newer generation of building performance simulationists, the conference had three competitions on offer this year: the Student Modelling Competition, the Best Student Paper, and the Best Poster Award. The results can be found later in this article.

The first keynote was given by Yuguo Li, from the University of Hong Kong. Yuguo Li presented his work on simulating winds and thermal environment at city scale, identifying the difference between western and Asian

cities, notably open low rise and high rise, as well as dense high-rise cities. He divided his talk into three topics: city thermal environments; city winds; and heat/ moisture domes. It was a fantastic opening keynote and no one will forget his use of candle clusters and plumes to illustrate urban scale heat plumes, and the large scale convergence phenomenon of densely clustered heat sources. (*Photo, right*)

An important event on day 1 was the student modelling competition, which attracted 12 entries. The brief was to use computer simulation to propose a retrofit design for a mixed-use building in Rome, Italy. The primary goal was to optimize performance whilst complying with architectural constraints. The competition committee (*photo*, *right*) shortlisted two teams and one individual to present their work and receive complimentary registration to BS2019. The winners were announced on the final day, and given copies of IBPSA's two books, *Building Performance Analysis* by Pieter de Wilde (kindly offered by Wiley) and the expanded second edition of *Building Performance Simulation for Design and Operation* edited by Jan Hensen and Roberto Lamberts (kindly offered by Routledge).

The second keynote speaker on day 1 was Christoph Reinhart, from MIT, US who gave an engaging and timely presentation on the topic of "digital worlds for analogue lives - building performance simulation in support of urban development" (*photo, right*). Christoph talked about how BPS can help address the world's most pressing problems: climate change, population growth, and societal inequality.

In the evening, participants were invited to the church of San Martino ai Monti for a concert, followed by the conference banquet. On this occasion, participation in a building simulation event crossed the 1000 threshold for the first time in history!

<image>

Day 2

The second day commenced with the third keynote speaker, Ardeshir Mahdavi, from TU Vienna in Austria (*photo, right*). His keynote on "world simulation: thoughts on global boundary condition", drew analogies from the tale of two rabbits: (1) deployment of building simulation leads to optimal energy / environmental performance; (2) improving building performance offers a solution to global environmental problems. His thought-provoking lecture left us with ambiguous feelings similar to those he quoted from the famous Italian engineer Enrico Fermi "Before I came here, I was confused about this subject. Having listened to your lecture, I am still confused - but on a higher level."

Following this, IBPSA announced its new fellows and awardees.

Day 3

The third and final day started with keynote speaker Susan Ubbelohde from the University of California, Berkeley (*photo, right*), on "Simulation in Practice: a wicked problem", which she defined as a problem that is difficult to define and inherently unsolvable. She quoted the philosopher Ludwig Wittgenstein who referred to his own subject as "nothing compared to the difficulty of being a good architect".





The conference ended with a plenary panel before the final closing ceremony followed by an Italian wine and cheese tasting event.

With 690 papers having been presented across 13 parallel sessions over 3 days, this was the largest conference on building simulation in the world. BS2019 has left us all deeply impressed by the volume and quality of the presentations, workshops, and posters which it generated.

During the opening ceremony President Lori McElroy confessed that her first BS conference was in 1997 in Prague and that since then she had attended every BS conference. At the closing ceremony she asked all those whose first conference it was to stand-up and to only sit down if they would not consider attending another one again - with a quick-witted Scottish 'don't you dare' to those who contemplated sitting down; we will see in 2021 if IBPSA NVL will be able to top the success of this year's conference. *Photos above right, IBPSA president Lori McElroy with conference chairs Vincenzo (on the right), Andrea (middle) and scientific conference chair Livio Mazzarella (on the left), and right, announcing BS 2021.*





Some statistics

	Research Papers	Case Studies
Building acoustics	10	0
Building Information Modelling (BIM)	20	4
Building physics	51	4
CFD and air flow	36	5
Commissioning and control	20	2
Daylighting and lighting	39	6
Developments in simulation	46	4
Education	10	2
Energy storage	19	0
Heating, Ventilation and Air Conditioning	41	6
Human behaviour	41	0
Indoor Environmental Quality (IEQ)	20	1
New software development	23	1
Optimization	52	10
Simulation at urban scale	88	4
Simulation to support regulations	35	3
Simulation vs reality	45	12
Solar systems	15	0
Validation, calibration and uncertainty	31	1
Weather	16	0
Windows	12	1
Zero Energy Buildings (ZEB)	22	8

All the papers from Building Simulation 2019 will shortly be available online at www.ibpsa.org.

More scenes from the conference

Top row: left, a packed conference hall; centre and right, the concert on day 1 Middle row: left, IBPSA Italy and conference organisers on day 2; centre, Veronica Soebarto introducing the final keynote speaker on day 3; right, setting the scene for BS 2021 Bottom row: relaxing with drinks after a stimulating conference















Photographs taken during the conference by conference staff can be found at http:// buildingsimulation2019. org/conference-photographs.

IBPSA Student Modelling Competition



Tareq Abuimara, Luminita Dumitrascu, Michael Gutland, Larissa Ide, Adrian Soble, Carleton University, Canada

Winner

Highly commended **>**



Elena Verticchio, La Sapienza University of Rome, Italy (on the left) and Clara Ceccolini, Nicola Franzoi, Pietro Malavolta, Silvia Ricciuti, Free University of Bolzano, Italy







Figure 5 - Illuminance distribution on the 2° floor of the building on Autumn equinox at 3 pm before (sx) and after (dx) the retrofit. The daylight was calculated in clear sky conditions at 0.8 m height from the floor and at a distance of 0.7 m from the walls.

Figure 3 - IEQA results before (sx) and

after (dx) the retrofit.

Sapienza UNIVERSITÀ DI ROMA

Visual comfor

Overlit

New IBPSA Fellows



Ruchi Choudhary



Vishal Garg



Christina Hopfe



Ted Kesik



Khee Poh Lam



Roberto Lamberts



Borong Lin



Jyotirmay Mathur



Lori McElroy



Dejan Mumovic



Jelena Srebric



Cheol-Soo Park



Michael Witte



Christoph Reinhart



Da Yan



Veronica Soebarto

New IBPSA Fellows (continued)



Zhiqiang (John) Zha

IBPSA Awards 2019

IBPSA Outstanding Young Contributor Award

Recognizes an individual at the beginning of their career who has demonstrated potential for significant contributions to the field of building performance simulation

Winner: Xin Zhou



IBPSA Innovative Application Award

Recognizes an individual, group or firm, who has made a significant contribution to the effective application and/or advancement of building performance simulation in practice

Winner: Drury B. Crawley

IBPSA Distinguished Achievement Award

Recognizes an individual who has a distinguished record of contributions to the field of building performance simulation, over a long period

Winner: Jan Hensen



*ibpsa*NEWS

IBPSA-Italy Award for the Best student paper

Six finalists:

- Feature Assessment in Data-driven Models for Unlocking Building Energy Flexibility Kathirgamanathan, Anjukan; De Rosa, Mattia; Mangina, Eleni; Finn, Donal Patrick
- An Approach For Obtaining And Extracting Occupancy Patterns In Buildings Based On Mobile Positioning Data Kang, Xuyuan; Yan, Da; Sun, Hongsan; Jin, Yuan; Xu, Peng
- Improving FEM computations for the simulation of thermograms at the urban scale Aguerre, José Pedro; Fernández, Eduardo; Beckers, Benoit
- Large-scale Co-simulation Framework For District Energy Systems Nageler, Peter; Schweiger, Gerald; Mach, Thomas; Heimrath, Richard; Schranzhofer, Hermann; Fochler, Lisa Marie; Hochenauer, Christoph; Leusbrock, Ingo; Fluch, Jürgen; Fink, Christian
- Modelling the Dynamic Thermal Response of Turbulent Fluid Flow Through Pipelines Salavati Meibodi, Saleh; Rees, Simon; Yang, Dongmin
- Linear Discriminant Analysis for Classification of Building Parameters for a Large Virtual Smart Meter Data Set Neale, Adam; Kummert, Michaël; Bernier, Michel

The winner is:

An Approach For Obtaining And Extracting Occupancy Patterns In Buildings Based On Mobile Positioning Data Kang, Xuyuan; Yan, Da; Sun, Hongsan; Jin, Yuan; Xu, Peng

Best Poster Awards

- Effect of Facade Thickness on Daylight Performance in a Reference Office Building Mangkuto, Rizki A. (presenting author); Fela, Randy Frans; Utami, Sentagi Sesotya
- Economic and Ecologic Evaluation of Low Temperature Waste Heat Integration into Existing District Heating Hering, Dominik (presenting author); Xhonneux, André; Müller, Dirk
- Energy Transition in Rural Areas Supporting Local Energy Planning by the Development of an Online-Tool for Identification and Promotion of Energy-Efficiency and the Use of Renewables
 Caemmerer-Seibel (presenting author), Uwe; Lück, Andrea; Osman, Ammar; Kiesel, Gerd; Völker, Conrad; Alfen, Hans Wilhelm; Cebulla, Daniel
- Subjective and Measured Evidence for Residential Lighting Metrics in the Tropics Jakubiec, J. Alstan (presenting author); Srisamranrungruang, Thanyalak; Kong, Zhe; Quek, Geraldine; Talami, Riccardo
- Application of A Housing Technology Assessment Simulation Platform in Regulation R&D Rasoul Asaee (presenting author), Alex Ferguson, Adam Wills
- Required Specification of Residential End-use Energy Demand Model for Application to National GHG Mitigation Policy Making

Minami Sugiyama (presenting author), Ayako Taniguchi-Matsuoka, Yohei Yamaguchi, Yoshiyuki Shimoda 📕

Forthcoming events

Date(s)	Event	Web site
2019		
07 November 2019	enviBUILD 2019, International conference on Buildings and Environment Bratislava, Slovakia	www.cab.sk/be2019
10 November 2019	UrbSys: 1st ACM International Workshop on systems for energy-efficient buildings, cities & transportation New York, NY, USA	https://dcp.ufl.edu/rinker/ACM
28-30 November 2019	BSCairo 2019, 2nd conference of IBPSA- Egypt Cairo, Egypt	http://bscairo.com
2020		
01-05 February 2020	ASHRAE Winter conference Orlando, Florida, USA	www.ashrae.org/conferences/2020-winter- conference-orlando
02-04 April 2020	14th International HVAC&R Technology Symposium Istanbul, Turkey	www.ttmd.org.tr/2020symposium
13-14 May 2020	IBPSA France 2020 Reims, France	www.ibpsa.fr http://conference2020.ibpsa.fr
15-16 June 2020	eSIM 2020 Vancouver, Canada	http://esim2020.sala.ubc.ca
12-14 August 2020	SimBuild (IBPSA USA and ASHRAE) Chicago, Illinois, USA	http://ashrae.org/BuildPerform2020
09-10 September 2020	Building Simulation & Optimization 2020 Loughborough, England, UK	www.bso2020.org
23-25 September 2020	BauSIM 2020 Graz, Austria	www.bausim2020.tugraz.at
13-14 October 2020	Buildsim Nordic 2020 Oslo, Norway	http://ibpsa-nordic.org
11-12 November 2020	USIM: Modelling, simulation and analysis of future urban energy systems Edinburgh, Scotland, UK	www.usim20.org.uk
07-09 December 2020	Asim: 5th Asia IBPSA conference Osaka, Japan	tba
2021		
01-03 September 2021	BS2021 Bruges, Belgium	https://bs2021.org

Note that the dates in this calendar may, but do not necessarily, include pre and/or post-conference workshop days



07 November 2019 Bratislava, Slovakia www.cab.sk/be2019/

enviBUILD 2019

The 14th International enviBUILD Conference will be held in the historic city of Bratislava, Slovakia, on 7 November 2019. This year's event will be organized by a team of the Department of Building Construction of the Faculty of Civil Engineering at the Slovak University of Technology in Bratislava under the chairmanship of Professor J. Hraška. An overview of past enviBUILD Conferences is available at www.cab. sk/pastevents.html.

The main focus of enviBUILD 2019 will be on building physics and applied technology in architecture, building construction and environmental engineering.

Call for Submissions

The international scientific committee invites contributions of original papers and posters that address the following themes and topics:

- Indoor Environment and its Hygienic Aspects
- Sustainable Buildings and Environmental Assessment
- Building Materials and Components
- Energy Performance of Buildings
- Hygrothermal Performance of Buildings
- Responsive and Adaptive Building Envelopes
- Ventilation of Buildings
- Daylighting
- Building Acoustics
- Energy and Indoor Environmental Simulation

The conference language is English. Papers will be peer-reviewed. The best peer-reviewed original papers will be published in the Slovak Journal of Civil Engineering, a WoS indexed journal. All the other papers accepted will be published in the Conference proceedings, which will be indexed by major indexing services and search engines and their abstracts made available in both electronic and printed versions.

10 November 2019 New York, USA https://dcp.ufl. edu/rinker/ACM UrbSys: 1st ACM International Workshop on systems for energy-efficient buildings, cities & transportation

The 1st ACM International Workshop

On Urban building energy sensing, controls, big data analysis, and visualization (UrbSys)

Workshop at ACM BuildSys, Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation

We invite original contributions in all emerging domains in urban building energy sensing, controls, big data analysis, and visualization to further move the built environment toward smarter operations.

Important Dates:

Abstract Registration: June 15, 2019 Paper Submission: June 22, 2019 Paper Notification: August 1, 2019

NEW YORK, NY November 10, 2019

Location: Columbia University Organizers: Dr. Ravi Srinivasan, Director, UrbSys Lab, University of Florida Dr. Mahabir Bhandari, Oak Ridge National Laboratory

Send your questions to sravi@ufl.edu

https://dcp.ufl.edu/rinker/acm

FLORIDA

College of Design, Construction & Planning

UNIVERSITY of FLORIDA

UrbSys

28-30 November 2019 Cairo, Egypt www.bscairo.com



Building Simulation Cairo 2019: 2nd IBPSA-Egypt conference

IBPSA-Egypt is proud to be holding its second international conference in Cairo during November, building on the success of its first, held six years ago. BS CAIRO 2013 attracted over 300 delegates and about 120 paper submissions, from which about 60 were selected by peer review, providing a forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, experiences and methods in the broad research field of environmental design, and immediately establishing BS CAIRO as the premier Building Simulation conference in Egypt and the Middle East. BS CAIRO 2019 will be hosted by The American University in Cairo.

The conference themes are:

- Sustainable Construction Materials
- Daylighting & Acoustics
- Energy Efficiency
- Environmental Design Education
- Optimization & Parametric Techniques
- Human Behavior
- Urban Environment
- Indoor Environmental Quality
- Simulations in Rating Systems
- Renewable Systems
- CFD and Air Flow
- Building Information Modeling

Selected papers will be submitted for publication in the Journal of Building Performance Simulation (JBPS), and the conference proceedings submitted for indexing by SCOPUS.

02-04 April 2020 Istanbul, Turkey www.ttmd.org. tr/2020symposium



14th International HVAC&R Technology Symposium

The 14th International HVAC&R Symposium of the Turkish Society of HVAC and Sanitary Engineers (TTMD) will be held in Istanbul from 2-4 April 2020 with contributions from universities, industry, public agencies & institutions, and non-governmental organizations. The event combines an international conference on innovative technologies and practices in HVAC with an exhibition of related science and technology. The main theme will be **Resilient HVAC Solutions to achieve a more Sustainable Future**, and the symposium includes a session devoted to modeling tools and simulation organised in coordination with IBPSA-Turkey.

The deadline for submission of papers is **01 December 2019**.

For more information please visit **www.ttmd.org.tr/2020symposium** or email either **symposium**@ttmd.org.tr or ibpsa.tr@ttmd.org.tr. ■



13-14 May 2020 Reims, France http://conference2020. ibpsa.fr

IBPSA-France regional conference 2020

IBPSA-France announce their regional biennial conference. It will take place from 13 to 14 May 2020, in Reims, France. Our main web site will soon give more information on the event, and a separate web site will be set up for the event at http:// conference2020.ibpsa.fr; this was not yet live at the *ibpsa*NEWS press date.

The main focus of the 2020 conference will be **biosourced materials for buildings**.



15-16 June 2020 Vancouver, Canada http://esim2020.sala. ubc.ca

eSIM 2020: IBPSA-Canada biennial conference

eSim is the conference of IBPSA-Canada, held biennially since 2001. IBPSA-Canada is one of the largest and most active of the 28 Regional Affiliates of the International Building Performance Simulation Association, with over 600 members. Though its reach for 2020 is global, eSIM will continue to represent the community of Canadian practioners and researchers pursuing advances in building performance simulation.

eSIM 2020 will include:

research publications in the form of annotated Jupyter Python Notebooks

- workshops on emerging fields in building science from data analytics and visualization to integrating machine learning with building performance simulation
- industry & policy tracks bring together regional experts to discuss British Columbia and Canada's state-of-the-art in simulation-driven building design and performance-driven building codes

eSim 2020 will be held at the University of British Columbia (UBC) in beautiful Vancouver, British Columbia, Canada. Ample discounted on-campus accommodation will be provided to conference participants. Further details will be provided in November 2019.

Background & themes

The building performance simulation domain is evolving. The increasing availability and affordability of collecting data from buildings is making it easier for simulation modelers to either calibrate physics-based models with data, or altogether replace some of these models with data. eSIM 2020 will explore synergies between simulation and data-driven methods of building analysis. An emphasis will be placed on new advances in machine learning and surrogate modelling techniques for building performance simulation; novel uses of operational building data and Internet of Things sensors; data-driven decision-making for building design and retrofits; and closing the performance gap. This broad theme will help the conference to extend beyond the traditional building simulation audience to include energy auditors and energy service providers, software developers and policy-makers.

Topics

- Building operations & controls
- Occupant behaviour, comfort and well-being
- Whole-building design
- Innovative HVAC systems and components
- Innovative building envelope systems
- Airflow / infiltration / natural ventilation
- Urban / district / community / stock modelling
- Renewable energy systems and components
- Impact of climate / future climate on building performance
- Simulation in practice
- The Internet-of-Things (IoT) and IoT-integration with building simulation
- Machine learning for building energy applications
- Surrogate-modeling / fitting models to synthetic data
- Optimisation / Design space exploration
- Parametric building design
- Data collection / sensors / smart meters / smart thermostats
- Model calibration to measured data
- Analysis of measured data / big data
- Code compliance / code development / incentive programs

Key dates

eSim 2020 is now accepting abstracts of 150 words for research papers and posters to be presented at the conference.

Deadline for abstract submissions: Full submissions due: 1 December 2019 21 February 2020

Further information

Further information about the conference and submission arrangements can be found at http://esim2020.sala.ubc.ca.

12-14 August 2020 Chicago, IL, USA http://ashrae. org/BuildPerform2020

JOINTLY HOSTED BY ASHRAE AND IBPSA-USA

2020 SIMBUILD BUILDING PERFORMANCE ANALYSIS CONFERENCE

Westin River North, August 12–14, 2020 in Chicago, IL

Get updates from top experts in the energy simulation industry

Highlights:

- · Focus on practical applications using existing tools
- IBPSA-USA Project Stasio Competiion
- ASHRAE LowDown Showdown modeling challenge
- PDHs, AIA LUs and LEED AP credits available
 - Virtual conference
- Vendor demonstrations
- Pre-conference courses on the 10th and 11th

www.ashrae.org/BuildPerform2020 Submit abstracts here: https://www.conftool.org/bpacs2020/ Scan this code to visit the conference website



09-10 September 2020 Loughborough, England, UK www.bso2020.org



Loughborough

niversity



Building Simulation and Optimization 2020

The Building Energy Research Group at Loughborough University is delighted to be hosting the Building Simulation and Optimization Conference in 2020.

Since we hosted the very first BSO in 2012 there has been rapid development in the software, tools, techniques and data sources available to the building simulation and optimization community. In this conference we aim to reflect on this transformation through a focus on the current state-of-the-art in the field and the challenges and opportunities that lie ahead. New for this conference is a series of pre- and post-conference workshops on the latest techniques in building simulation and optimization.

We hope you can join us, and we look forward to welcoming you to our superb 440 acre single-site campus situated in the heart of England.

The call for abstracts is now open and the submission deadline is 1 December 2019.

For more information about the conference and submission arrangements please visit www.bso2020.org.

23 - 25 September BauSIM 2020

Invitation

We are pleased to invite you to attend the 8th BauSIM Conference at Graz University of Technology. The BauSIM Conference has been organized under the auspices of IBPSA Germany and Austria since 2006 and takes place every second year. Building and district simulations and associated methodologies are at the focus of the conference. Emphasis is also placed on complementary topics such as building information modelling (BIM), component-level simulations or monitoring and operation of buildings and urban systems. The conference addresses stakeholders from science and education, the construction industry (design, planning, construction and operation), software development and public administration. It provides a forum for presenting research results and for multidisciplinary discussions of the latest trends in the field of simulation-based design of sustainable buildings and districts.

Linking and integration of data are increasingly shaping developments in both, building simulation and BIM. Based on the contents of the previous conferences, BauSIM 2020 will thus put a special focus on topics related to this most relevant field of research, including the development of digital twins, the use of IoT technologies for energy optimization of buildings and districts as well as the use of machine learning in the context of building operation and user behaviour.

We are looking forward to your participation and to an interesting and inspiring conference

Michael Monsberger | Markus Krüger | Alexander Passer

23-25 September 2020 Graz, Austria www.bausim2020.tugraz.at

Topics BauSIM 2020

- BIM-based planning tools and integration approaches
- District building system human
- Lifecycle-oriented modelling and simulation of buildings and urban systems
- Modelling of building physics on construction component level
- Numerical procedures, optimising and implementation
- Product data and databases
- Validation scenarios and quality management
- Monitoring and optimising operation of buildings
- and urban systems Teaching, training and further education in the field of simulation
- Knowledge transfer into simulation practice and case studies

For more details about the conference topics, visit the BauSIM 2020 website.

Important Dates

- Deadline for abstracts: 31 October 2019
- Deadline for full papers: 15 March 2020
- Early bird registration until: 30 June 2020

The main conference language at BauSIM 2020 will be German, but sub-missions in English are also accepted. Depending on the number of English submissions, entire sessions will be held in English.

Chairs

Michael Monsberger

Graz University of Technology Institute of Construction Management and Economics | Building Services Work Group

Markus Krüger Graz University of Technology

Institute of Technology and Testing of Construction Materials

Alexander Passer Graz University of Technology Institute of Technology and Testing of Construction Materials | Working Group Sustainable Construction

Conference Secretariat

Marta Mierzeiek

Graz University of Technology Institute of Construction Management and Economics

- a bausim2020@tugraz.at Lessingstraße 25/III 8010 Graz
- Austria

In cooperation with:



8th Conference of IBPSA *ibpsa* Germany and Austria

TU



BauSIM2020

23 - 25 September 2020 Graz University of Technology



Graz, the capital of Styria, is the second largest city in Austria with about 293,000 inhabitants. It is an attractive and cosmopolitan city, where people from 160 different nations live. The city of Graz hosts four universities and two universities of applied sciences with over 50,000 students. Graz is located in the foothills of the Alps at the river Mur and impresses you with its southern flair and the nearby vinevards of the famous southern Styrian wine region. The historic city centre, which is placed around the Schlossberg with the well-known clock tower 'Uhrturm', and the castle Schloss Eggenberg have been declared UNESCO World Heritage Site. Graz was European Capital of Culture in 2003 and has become a UNESCO City of Design in 2011.

Graz University of Technology

Science - Passion - Technology: Established in 1811. Graz University of Technology is located in the centre of Graz. It currently has over 13,000 students in the fields of natural sciences and engineering. The graduates from Graz University of Technology, around 1,000 per year, are in high demand on the employment market. The unique and strong networking with regional and international business partners is a crucial factor of success for the university in its five Fields of Expertise. The mission of Graz University of Technology is driven by strong passion for a responsible and sustainable development of our society, economy and environment.





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BuildSim Nordic 2020 conference: 13-14th October, Oslo



Oslo Opera House © Matthias Haase

1. ANNOUNCEMENT AND CALL FOR ABSTRACTS

Submission deadline: 15th of December 2019

You are invited to participate in the *BuildSim Nordic 2020* conference, to be held on the **13th & 14th of October** hosted by OsloMet University in Oslo, Norway, organized in cooperation between the Nordic chapter of IBPSA, OsloMet and NORVAC. The conference programme includes a technical tour and rooftop dinner in the new Munch Museum.

The purpose of the event is to create a platform for exchanging ideas, issues and research findings, in the field of building performance simulation. It facilities national & international collaboration, and the meeting of minds between practitioners, researchers and students.

Participants

The event is open for members and non-members of IBPSA-Nordic. Any research related to building simulation, including system design, HVAC, energy production/use, indoor climate and environmental issues, is eligible to be presented at the event.

Topics

- Building acoustics
- Building Information Modelling (BIM)
- Building physics
- CFD and air flow
- Commissioning and control
- Daylighting and lighting
- Developments in simulation
- · Education in building performance simulation
- Energy storage
- Heating, Ventilation and Air Conditioning (HVAC)
- Human behavior in simulation
- Indoor Environmental Quality (IEQ)
- New software developments
- Optimization
- Simulation at urban scale
- Simulation to support regulations
- Simulation vs reality
- Solar energy systems
- Validation, calibration and uncertainty
- Weather data & Climate adaptation
- Fenestration (windows & shading)
- Zero Energy Buildings (ZEB)
- Emissions and Life Cycle Analysis

Abstracts

- The abstracts should be
- written in English;
- no more than one A4 page in size;
- describe the research done;
- a template will be made available.

Language

The event will be held in English.

Submission process

All authors whose abstract is accepted will be invited to submit a full paper. All accepted papers will be invited to give an oral or poster presentation at the event. The papers accepted for oral presentation will be published in the conference proceedings published by: SINTEF Akademisk forlaget:

SINTER ARAGEIIISK TOTaget.

https://www.sintef.no/byggforsk/sintef-akademisk-forlag2/ SINTEF Proceedings is an Open Access publication accepted as Level 1 publication in Norway, Denmark and Finland.

Key dates

15 th December 2019	Deadline for abstract submission
28th February 2020	Acceptance of abstracts
30th April 2020	Deadline for submission of full paper
30th June 2020	Acceptance of full paper
15th August 2020	Deadline for submission of final paper

Additional information

Can be found at: <u>http://ibpsa-nordic.org/</u> or requested from matthias.haase@sintef.no

uSIM 2020 – Urban Energy Simulation

From building to buildings – Urban and community energy analysis Heriot-Watt University, Edinburgh 11-12th November 2020



USIM 2020 CONFERENCE ANNOUNCEMENT – 1ST CALL FOR ABSTRACTS

We are pleased to announce a call for abstracts for the **2nd IBPSA-Scotland uSIM conference**. Following on from the success of uSIM2018, this conference will further explore the state-of-the-art in urban energy modelling. Hosted by the Urban Energy Research Group at Heriot-Watt University in Edinburgh, the conference panel are looking for research papers from academia and industry in topics covering:

- COMMUNITY ENERGY MODELLING
- FUTURE FORMS OF STOCK MODELLING OF THE BUILT ENVIRONMENT
- USE OF BIG DATA IN THE UNDERSTANDING OF URBAN ENERGY
- SOFTWARE DEVELOPMENTS IN DYNAMIC SIMULATION
- MULTI-BUILDING ENERGY PERFORMANCE ASSESSMENTS
- APPLICATIONS OF BOTH BOTTOM-UP AND TOP-DOWN ENERGY MODELLING OF
 BUILDINGS

The deadline for abstract submissions is February 21st. All abstracts will be peer reviewed by the uSIM Technical Committee with full paper submission due June 30th

Abstracts of up to 400 words can be submitted via the uSIM conference website (once live in October) <u>http://www.usim20.org.uk</u>

We look forward to welcoming an international audience at Edinburgh in 2020

The USIM Team





01-03 September 2021 Bruges, Belgium https://bs2021.org

BS 2021 17th IBPSA International Conference & Exhibition

Following the successful BS 2019 in Rome, Bruges — 'the Venice of the North' — is hosting our next world building simulation conference. BS 2021 is scheduled for 1-3 September 2021, so save the date in your calendars already.

Bruges, a UNESCO world heritage city in Belgium, has flourished since the middle ages, and has kept its original and charming atmosphere ever since. A network of channels connects the numerous historical buildings in the center. The Belfry halls, located at the central market place, will be the heart of our conference. Bruges is a short 20 km distance from the coastline, and only 60 minutes by train from Brussels and two and a half hours from London, Paris and Amsterdam.

BS 2021 is being organized by a team of very enthusiastic people drawn from two universities (Leuven and Gent) and two companies (Boydens Engineering and Daidalos-Peutz), assisted by the regional affiliate IBPSA-NVL.

As ever, the key to a great conference will be a good mix of academics, R&D people, practitioners and policy maker, and the conferencee is being planned to appeal to them all from day 1.



The social side of conferences is important, too. Amongst other events, BS 2021 will include a competition to compose a BS 2021 Bruges belfry theme. Musician members of our community are invited to write an original and exiting polyphonic song for the 47 bells of the impressive carillon in the Bruges Belfry, which will wake up the city every day, while we make our way to the conference sessions beneath the tower. If the challenge of composing the belfry theme appeals to you please email music@bs2021.org for more information.

Practical organisation organisation of BS 2021 is in the hands of the KU Leuven Conference Office, who will help you wherever they can; please send any questions to info@bs2021.org.

We will keep you informed about progress in organising the conference through our website https://bs2021.org.



Software news



New simulation climate data for entire world available from Climate. OneBuilding.Org

Climate.OneBuilding.Org has been busy since the last *ibpsa*NEWS! Since the April 2019 *ibpsa*NEWS, we have added new climate data (TMYx) for more than 3,400 locations for the following countries:

- Canada
- United States

These TMYx are typical meteorological year data derived from hourly weather data through 2018 in the ISD (US NOAA's Integrated Surface Database) and NSRDB PSM V3 (https://nsrdb.nrel.gov/) solar data using the TMY2/ISO ISO 15927-4:2005 methodologies. There may be two TMYxs for a location, e.g., Washington Dulles Intl AP, VA, USA: USA_VA_Dulles-Washington.Dulles.Intl.AP.724030_TMYx and USA_VA_ Dulles-Washington.Dulles.Intl.AP.724030_TMYx.2004-2018. In these cases, there's a TMY for the entire period of record and a second TMY for the most recent 15 years (2004-2018). Not all locations have recent data.



Adding these data to the earlier sets for the Americas, Antarctica, Africa, Europe, Asia, and SW Pacific, **Climate.OneBuilding.org** now provides climate TMYx data at no cost for more than 13,000 locations and another 3,200 from other data sources worldwide. This TMYx data set is now complete, including all locations available from the ISD worldwide. All data have been through extensive quality checking to identify and correct data errors and out of normal range values where appropriate.

Each climate location .zip contains: EPW (EnergyPlus weather format), CLM (ESP-r weather format), and WEA (Daysim weather format) along with DDY (ASHRAE design conditions in EnergyPlus format), RAIN (hourly precipitation in mm, where available), and STAT (expanded EnergyPlus weather statistics).

For more information or to download any of the weather data (at no cost) go to http:// Climate.OneBuilding.org.



ASHRAE publishes energy simulation-aided design standard in Spanish

ASHRAE's newly translated energy simulation aided design standard can now help Spanish-speaking engineers meet their energy efficient benchmarks.

The ASHRAE Argentina Chapter translated Standard 209-2018, Energy Simulation Aided Design for Buildings Except Low-Rise Residential Buildings, into Spanish recently creating, Estándar ASHRAE 209-2018, Diseño Asistido por Simulación Energética para Edificios excepto Edificios Residenciales de Baja Altura.

One of the translators Verónica Rosón, BEAP, Member ASHRAE, who is a Chapter Technology Transfer Committee co-chair for the ASHRAE Argentina Chapter, said the translated standard can help Spanish-speaking engineers, architects and technicians create projects that are international benchmarks for sustainable buildings.

ASHRAE Standard 209 describes a methodology to apply building energy modeling to the design process and outlines minimum requirements for providing energy design assistance using building energy simulation and analysis in new and existing buildings.

The standard resource is helpful for modelers seeking to quantify the impact of design decisions at the point in time at which they are being made.

You can get more information at www.ashrae.org/news/esociety/translated-energysimulation-aided-design-standard-to-help-spanish-speaking-engineers-achieveenergy-goals.



American Institute of Architects (AIA) publishes updated guide on energy modelling

The American Institute of Architects (AIA) has significantly updated its guide on energy modelling. IBPSA is mentioned multiple times, including this:

"Whole building energy simulations are usually performed by "BPS professionals." The organization for BPS professionals is the International Building Performance Simulation Association (IBPSA)."

Quite a feather in IBPSA's cap!

This is the fourth iteration of the AIA guide, available at www.aia.org/resources/8056-architects-guide-to-integrating-energy-modeli.

HARVEST: MIT's new urban food production simulation plug-in for UMI, the Urban Modeling Interface

Khadija Benis and Christoph Reinhart, MIT Sustainable Design Lab

Some of you might be interested in trying out HARVEST, our new plug-in for the Urban Modeling Interface. HARVEST estimates food yields of indoor farms and their associated operational building energy use, water use and carbon emissions, as well as their economic performance through metrics such as operational costs and job creation.



You can find more information about UMI at www.urbanmodeling.net and watch video tutorials and download the installer at https://urbanfoodprints.com/#/ harvest. Please note that you need Rhino 6 for Windows and the latest UMI (available from web.mit.edu/sustainabledesignlab/projects/umi/index.html) to use HARVEST.

New home for tables contrasting building simulation tools

Jon Hand and Dru Crawley

IBPSA Fellows Jon Hand and Dru Crawley would like to announce a new host site for the web pages contrasting building simulation tools formerly on Jason Glazer's www. onebuilding.org. These are now at http://contrasting.no-ip.org/ESP-r_tour/timings.html.

To explore the impact of hardware and software choices we created a matrix of computer types (legacy, recent, virtual with different CPU types), operating systems (Windows, Linux, OSX, Chromebook) and simulation tools (ESP-r, EnergyPlus, Radiance) as well as a collection of models exercising different domains from simple to moderately complex. We then ran timing tests for various scenarios and explored the patterns to see what hardware, workflow and user choices have an impact.

What we found:

The computational demands of simulation tools and simulation projects are only ROUGHLY correlated with the rankings generated by standard benchmarking tools. The test matrix focuses attention on choices that actually impact timings.

Running simulation in a virtual environment used to roughly halve its computational speed but with newer implementations of Virtual Box and VMWare the differences in throughput are less noticeable. And because there is generally less RAM you lose much of the efficiency of post-processing from the file buffer. There is a smaller computational and post-processing hit for EnergyPlus and Radiance than for ESP-r.

If you are setting up a virtual computer for simulation use make sure there is 20-30GB of free space (because you will easily fill this with model and performance data files). If possible, give the virtual computer more than 2GB of RAM. Virtual computers only make sense on an SSD.

ESP-r runs almost as efficiently on Windows 10 as on Linux (everything else being equal) but post-processing suffers from slower disk access. EnergyPlus on Windows 10 is roughly in line with Linux.

The advent of Windows Subsystem for Linux (WSL) allows standard Linux distributions of simulation tools to be installed on W10 computers and make use of similar work-flows and automation scripting.

There appears to be little or no difference in computing speed for compute-intensive tasks i.e. CFD; however, for other simulation tools disk access is even slower than virtual disks (approaching speeds associated with SDHC cards).

Yes, you can run all these simulation tools on a Chromebook. These computers do tend to be underpowered (a Raspberry Pi 3 was often faster) and disk access is horrific. So you might want to stick with constrained projects and seasonal rather than annual assessments. The latest generation of ARM computers is approaching the speed of some legacy computers and is an increasingly viable option for some projects.

Additional computer memory can speed up post-processing tasks by one or two orders of magnitude if it allows data recovery from memory (the file buffer) as opposed to disk access. Subtle changes in simulation task ordering can also reduce elapsed time by an order of magnitude. An investment in additional RAM is often much more cost effective than the latest-greatest CPU.

Work-flows matter! Running assessments in parallel can cut elapsed time but risks being disk-bound for seasonal or annual assessments. Post processing in parallel also risks being disk bound to the point where post-processing can take more time than the original assessments. Even for tools such as Radiance which are designed to use multiple cores the overhead can be considerable. The constrained models used for simulation training run focused and seasonal assessments on just about the full range of computer kit tested in less than a minute (usually in the order of seconds). This suggests that legacy computers (don't throw away that Lenovo X220 thinkpad!) and ARM based single-board-computers (a dozen fit in a briefcase) can be used for training workshops.

The benchmarks suggest Conduction Finite Difference is not as horrific as many practitioners assume and for many projects there is no need to fall back on the legacy CTF solver in EnergyPlus.

If you have recompiled a simulation tool to introduce a new facility, once you have finished debugging it be sure to switch over to optimized builds for distribution because the performance hit is massive.

Early use of focused assessments (e.g. one week or one month reality checks) are critical for QA. They quickly improve our understanding of how the building and/or systems are working prior to production runs on more powerful computers.

There is a wealth of detailed information about our tests and results at http:// contrasting.no-ip.org/ESP-r_tour/timings.html, but there are still gaps in the tables and several simulation tools which are under-reported. If you have information that would help fill in these gaps or would like to comment on existing pages please email Jon Hand at jon@esru.strath.ac.uk.

LBNL releases major update to the Modelica Buildings Library

LBNL has released the Modelica Buildings Library v6.0.0, which is based on the Modelica IBPSA Library (https://github.com/ibpsa/modelica), and it has also released BuildingsPy 2.0.0 to help in automating Modelica simulations and development.

The Modelica Buildings Library 6.0.0 is a major new release that contains various new packages, new models and improvements to existing models.

The following major changes have been made:

- Various new packages have been added, such as:
 - A package for simulating occupancy that resulted from IEA EBC Annex 66.
 - A package with models for geothermal borefields.
 - A package with blocks for control of shades and of outdoor lights.
 - A package with blocks that allow generating time series and scatter plots, and writing these plots to one or several html files.
 - A package with blocks for unit conversion.

Various new control blocks have been added to Buildings.Controls.OBC.CDL to support OpenBuildingControl (see https://obc.lbl.gov)

This release also improves various existing models.

The library has been tested with Dymola 2019FD01, Dymola 2020, and with JModelica (revision 12903).

For a detailed list of changes, see http://simulationresearch.lbl.gov/modelica/ releases/v6.0.0/help/Buildings_UsersGuide_ReleaseNotes.html#Buildings. UsersGuide.ReleaseNotes.Version_6_0_0.

For more information and download, visit https://simulationresearch.lbl.gov/modelica.

The development sites are https://github.com/lbl-srg/modelica-buildings and https://github.com/lbl-srg/BuildingsPy.

Building Simulation 2023: Call for Proposals

The board of IBPSA is pleased to issue the following call for proposals from parties interested in hosting the international conference Building Simulation 2023. A complete proposal should be sent to the Conference Committee chair, Paul Strachan (p.a.strachan@strath.ac.uk), no later than 28 February 2020. Discussions with the Conference Committee chair of potential proposals prior to the due date are strongly encouraged. The proposal should address the following items:

- proposed venue
- dates
- details of conference secretariat
- organisation time line
- details of rooms for plenary sessions, parallel sessions and posters
- availability of free Wi-Fi connections for participants
- detailed budget in local currency and in US dollars
- discussion of possibilities for sponsorship
- details of the conference presentation schedule (e.g. number of parallel and plenary sessions), including innovative ideas for conference delivery methods and audience interaction
- publication of proceedings
- details of accommodation, including costs, for delegates and students
- social events
- options for pre and post conference tours, software demos and courses
- options for programme for accompanying persons
- involvement of existing or planned IBPSA Regional Affiliate(s)
- experience of the organising committee with IBPSA and with organisation of similar conferences. Note that the BS'19 conference had around 1000 participants.
- conference software for scientific review and registration: Conftool (https://www.conftool.net) is the preferred option as it has been widely used in previous conferences and there is support for its use by IBPSA.

To assist your decision there are several documents available (please email the Conference Chair for information):

- The IBPSA Regionalization Guide (available at http://www.ibpsa.org/downloads/IBPSA-Regionalization-Guide.pdf) describes IBPSA's regionalization plans: we schedule all of the Building Simulation conferences in regions with existing affiliates or regions that are starting a new affiliate organization. In a region currently without an affiliate, we will only consider holding the conference there if a regional affiliate organization will be in place by the time of the conference.
- Final reports for previous Building Simulation conferences, which include details of organization, finances (e.g. planned budget and actual expenses), post-conference surveys and other information useful to organizers of future Building Simulation conferences.
- A document on sponsorship contains suggestions regarding the exposure and benefits of Building Simulation sponsors.

- A recent Memorandum of Understanding serves as an example for the contract which will be agreed between IBPSA and the organizers of Building Simulation 2023.
- A budget template.

Proposals will be evaluated using the following criteria:

- Attractiveness and accessibility of location is this location likely to attract delegates from around the world? (10%)
- Affordability of venue is the combination of registration fee and accommodation costs likely to be acceptable to potential delegates? (In this respect, a range of accommodation types including student hostels is a benefit.) (10%)
- Quality of conference plan and facilities are the facilities and conference plan conducive to a well-run conference? (10%)
- Likelihood of financial success will the conference financial plan likely lead to breaking even (at least)? A financial plan that does not rely on unconfirmed sponsorships to break even is strongly preferred. (30%)
- Support of IBPSA goals will choosing this proposal help draw new members into IBPSA (in new regions) or support membership in existing regions? (10%)
- Diversity of location is this location sufficiently distant from recent conferences? (10%)
- Regional participation is the proposal well-supported by volunteer effort from the regional affiliate and/or nearby regional affiliates? (10%)
- Experience of members of the organizing committee with IBPSA, and with organizing IBPSA affiliate conferences or conferences similar to Building Simulation. (10%)

The final decision regarding the location of Building Simulation 2023 resides with the IBPSA Board of Directors and will be made following a thorough evaluation of all submitted proposals.

A decision regarding proposals can be expected by the end of May 2020.





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Building Performance Analysis

Pieter de Wilde

Improved building performance is a key goal for all building owners, be it energy efficiency, indoor air quality, productivity or user comfort. In the context of increasingly scarce resources, these aims place significant demands on the design, construction and operation of new and existing buildings. With the emergence of big data and corresponding analysis techniques, building owners and operators will have access to huge amounts of information, yet the performance gap between predictions (by simulation and extrapolation of data) and measurements remains significant.

The purpose of Building Performance Analysis is to explore and bring together the existent body of knowledge on building performance analysis. In doing so, it provides a working definition of building performance, and an in-depth discussion of the role building performance plays throughout the building life cycle. It explores the perspectives of various stakeholders, the functions of buildings, performance requirements, performance quantification (both predicted and measured), criteria for success, and performance analysis. Driving this discussion are the following questions:

- What is building performance?
- How can building performance be measured and analyzed?
- How does the analysis of building performance guide the improvement of buildings?
- What can the building domain learn from the way performance is handled in other disciplines?

In answering these questions the book makes a major contribution to the application of building performance concepts in the operation and management of high performance buildings



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ISBN: 9781119341925 To be published in April 2018

Building

Analysis

Performance

Explores and brings together the existent body of knowledge on building performance analysis

News from IBPSA affiliates

IBPSA affiliates are asked to submit a report to the IBPSA Board each year to keep Board members informed about their activities and membership. These are too detailed to include in ibpsaNEWS, so affiliates have been asked to make their latest annual report available through their web sites, and this section includes only selected, recent news. Other news from affiliates may be available from their websites; the URLs for these are available on the IBPSA Central web site at www.ibpsa.org/?page_id=29.

IBPSA-Argentina

IBPSA-Argentina is pleased to announce its website: http://ibpsa.com.ar.

The Argentina, Brazil and Chile Chapters of IBPSA organised the 6th South American Congress of Building Simulation - IBPSA-LATAM - in Mendoza, Argentina, on 17 -18 October 2019, to provide an opportunity for regional discussion for all those involved in the field of building performance simulation.

The objectives of this event are:

- To connect the local chapter (Argentina) and its members with the IBPSA International community.
- To promote and disseminate advances in and original results of scientific and technological research in the field of building performance simulation.
- To promote the participation of scientific and academic institutions at a regional level, as well as companies and private practitioners.
- To encourage the exchange of ideas and experiences related to research, management and teaching.
- To promote a framework for the generation of strategic partnerships, and the development and transfer of technology in the different fields covered.
- To publish the congress proceedings in a digital format and to disseminate the research findings presented during the event through digital publication of proceedings.

This meeting provides a space for scientific-academic discussion, which encourages the sharing of knowledge and research on simulation tools, new developments and their applications. It is intended for researchers, students, teachers, building planners and professionals from the construction industry who work in the study, management, research, dissemination and teaching of building performance simulation.

IBPSA-India

In 2018 IBPSA-India launched its website **www.ibpsaindia.org**, which provides information about all its events.

During the past year, the Board of Directors have held four society meetings to finalize activities and the way ahead for IBPSA India, and organised two technical events.

Event-1: 1.5-day Workshop on Lighting Simulation for Enhanced Visual Comfort & Energy Efficiency, 2-3 November 2018

The Indian Green Building Council (IGBC) and IBPSA-India jointly organized a 1.5-day workshop on lighting simulation during the 16th Green Building Congress held in Hyderabad on 2 - 3 November 2018. More than twenty building professionals, architects, engineers, consultants, manufacturers, and academics participated in this workshop.

The workshop offered hands-on experience on artificial lighting in commercial building and its simulation, fundamentals of daylighting simulation and compliance approach, daylighting simulation including UDI calculation, and energy efficiency through controls followed by live demonstration of working of lighting controls. The workshop ended with understanding of lighting energy efficiency through optimum window area, reduction of Lighting Power Density (LPD).

Three scenes from the workshop are on the right. For more details, visit http://ibpsaindia.org/events-ibpsa/daylighting2018

Event-2: Technical Talk on theme of HVAC of Tomorrow, 27 February 27 2019

A workshop on "Basics of Modelling Radiant Cooling Systems in Indian Buildings" by Mr. SMH Adil, Director, GEED India was conducted during ACREX 2019 held in Mumbai on 27 February 2019. It was jointly hosted with the Indian Society of Heating, Refrigeration & Air-conditioning Engineers (ISHRAE) and the Indian Green Building Council (IGBC).





The workshop offered hands-on experience on modelling radiant cooling systems in energy simulation software. The radiant cooling system was modelled and the sensitivity of various parameters in sizing and operational performance was discussed in this 1-day workshop.

IBPSA-Mexico

The Autonomous University of Chiapas (UNACH, initials in Spanish) held a training course on *EnergyPlus and Euclid* on 9-12 July 2019, taught by Dr. Pavel Ruiz-Torres, vice-president of IBPSA-Mexico. Aimed at architects of the Mexican southern state of Chiapas, which is considered as a warm conditions region, it was designed to increase the use of building modeling amongst construction professionals in order to assist in planning architecture projects that respond to the climatic conditions and the occupant necessities of this state in particular.



IBPSA-Nordic

IBPSA-Nordic will hold its 9th BUILDSIM_NORDIC conference in Oslo on 13–14 October 2020. Details are available at http://ibpsa-nordic.org/events/buildsim-nordic-2020-conference.html and elsewhere in this *ibpsa*NEWS.

Matthias Haase (Senior Research Scientist at Sintef, Norway) interviewed the IBPSA-Nordic President, Assistant Professor Jørgen Eric Christensen, DTU, Denmark about IBPSA-Nordic and the conference.

Matthias Haase (MH): Jørgen, please tell us a bit about IBPSA-Nordic.

Jørgen Eric Christensen (JEC): IBPSA-Nordic is the regional affiliate of IBPSA for four countries: Denmark, Finland, Norway and Sweden. IBPSA-Nordic is linked to the IBPSA-World association but acts as an independent organisation.

The first IBPSA-Nordic Board meeting was held on 12 August 2011. I was a founding member and have been a board member since then. The board is composed of twelve members, three from each member country. I have been the president since 2015. As in most chapters of IBPSA, a Board member must be active in the field of building simulation and must be based in one of the member countries.



MH: Is that a lot of work?

JEC: The Board meets twice a year to discuss and decide the affairs of the association, including the financial report. At Board meetings, the Board strives to reach decisions by consensus. This is a sensitive part of work in this IBPSA chapter since it consists of members from 4 different countries with different approaches to BPS.

The President actively participates in pursuing the goals of the organisation and chairs the Board meetings. The Secretary (you!) assists the membership and the Board in the execution of their programs of work and in the coordination and progress of the organisation's activities. The Secretary also takes care of informing all members about the organisation's activities. The Board members act as contact points in their countries. You can find the list of board members on our website at http://ibpsa-nordic.org/people.html.

MH: Has IBPSA-Nordic organized BUILDSIM-NORDIC conferences before?

JEC: Yes, IBPSA-Nordic has organized several seminars and conferences. Our first 2-day seminar on building performance simulation was held in December 2011 and we have been running this event every year since then (in odd years as seminars, in even years as conferences). The events have been organized by different members of IBPSA-Nordic and held in different locations in various countries. We want to provide a platform for meeting and exchange of knowledge and ideas around BPS. The events are open for members and non-members of IBPSA-Nordic. Young researchers, e.g. PhD. students, Master and postgraduate degree students and postdoctoral researchers are particularly encouraged to participate. The events have always been a great success, attracting 30-40 participants from both academia and practice.

MH: Do you give out Awards at these events?

JEC: At each BuildSim-Nordic event since 2014, the annual IBPSA Nordic Simulation Award has been presented, announced to all IBPSA-Nordic members by email and on the IBPSA-Nordic web pages. We really

want to award outstanding research or implementation work in the field of building simulation. The selection of the award winner is made by the IBPSA-Nordic board.

MH: Now you are promoting the BUILDSIM-NORDIC 2020 conference. How will this differ from previous conferences, and why?

JEC: The main difference this time is that we will use a double-blind review process for both abstracts and papers, which will be published in conference proceedings. In the previous BUILDSIM-NORDIC events we had a simple abstract review process and we made the presentations available on our website.

Organising an international conference annually is a lot of work, so up to now we have aimed to hold events which are relatively small and are of interest principally within the Nordic countries. Our previous events have always resulted in an increase in new members, and by 2018 our membership had reached 245. This increase has been generated by inviting potentially interested people, many of whom have later joined IBPSA-Nordic. Now we want to provide a platform to enable our organization to grow further, and we particularly want to increase interest in our conferences from students and from sponsors. We know that students nowadays prefer more international conferences (with a full review process etc.), so we have decided to change the conference format and to organize it biennially with double-blind review and proper publication of the proceedings.

MH: What is the conference format?

JEC: The event is open for members and non-members of IBPSA-Nordic. Any research related to building simulation, including system design, HVAC, energy production/use, indoor climate and environmental issues, is eligible to be presented at the event. The topics include Building acoustics, Building Information Modelling (BIM), Building physics, CFD and air flow, Commissioning and control, Daylighting and lighting, Developments in simulation, Education in building performance simulation, Energy storage, Heating, Ventilation and Air Conditioning (HVAC), Human behaviour in simulation, Indoor Environmental Quality (IEQ), New software developments, Optimization, Simulation at urban scale, Simulation to support regulations, Simulation vs reality, Solar energy systems, Validation, calibration and uncertainty, Weather data & Climate adaptation, Fenestration (windows & shading), Zero Energy Buildings (ZEB) and Emissions and Life Cycle Analysis.

All authors whose abstract is accepted will be invited to submit a full paper. All accepted papers will be invited to give an oral or poster presentation at the event. The papers accepted for oral presentation will be published in the conference proceedings published by SINTEF Akademisk forlaget: https://www.sintef.no/byggforsk/sintef-akademisk-forlag2/ As you know, SINTEF Proceedings is an Open Access publication accepted as Level 1 publication in Norway, Denmark and Finland.

MH: Thank you!

Key dates and other information are available from the IBPSA-Nordic website at http://ibpsa-nordic.org/ events/buildsim-nordic-2020-conference.html and elsewhere in this *ibpsa*NEWS.

Papers from IBPSA-Nordic's past events are also available through the website via the 'Events' tab at the top of the home page.

News from IBPSA Affiliates

SINGAPORE CHAPTER

August 2019 Issue- 1



NET ZERO ENERGY BUILDING GUIDED TOUR BY NUS ASST PROF (DR) CLAYTON MILLER

IBPSA is back in Singapore

by Dr Prashant Anand

The <u>International Building</u> <u>Performance Simulation</u> <u>Association</u> (IBPSA), is now registered with Singapore's Registry of Societies on 7 April 2019.

The Vision & Mission of IBPSA Singapore are:

- To provide a forum for the exchange of information between researchers, developers and practitioners operating in the area of building performance simulation and related issues.
- To advance and promote the science and technology of building performance simulation in order to improve the design, construction, operation, maintenance and refurbishment of buildings, through:
 - Identifying problems within the built environment that

may be solved by improved simulation tools and techniques;

- Identifying the performance characteristics of buildings on which simulation should be focused;
- Identifying building performance simulation research and development needs and transfer new developments to the user; and
- Promoting standardization of the building simulation industry.
- 3. To inform and educate its members and the public regarding the value and the state-of the-art of building performance simulation.



NEWSLETTER Issue 1 August 2019

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Our webpage QR code



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SINGAPORE CHAPTER | Issue 1



Chapter President Dr. Steve Kardinal JUSUF

Our current Chapter President is Assistant Professor at Singapore Institute of Technology (SIT), Singapore

Message:

"Dear IBPSA Singapore members,

We are now on our 3rd quarter of this term 2018/2019 and following to our NUS SDE4 Net Zero Energy Building Tour & Discussion on Friday, 17 May 2019 at NUS Singapore, IBPSA is proud to support the inaugural International Built Environment Week (IBEW), the first fullyintegrated event in the Asia Pacific that covers the entire built environment life cycle and value chain.

Presented by the Building and Construction Authority of Singapore, the IBEW will convene under the theme 'Transforming the way we build' and showcase today's best practices and tomorrow's innovations in four key areas: sustainability, construction productivity, digitalization and smart facilities management."

Image of past events





Opening remarks by Asst. Prof. Steve Kardinal Jusuf



SDE4 ZEB Guided tour by Asst Prof Clayton Miller

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SINGAPORE CHAPTER | Issue 1

Upcoming events

IBPSA Singapore supports IBEW



As a member of IBPSA, you will enjoy more than 40% discount on your conference ticket at \$680 (U.P \$1,200). So grab this opportunity and register today. Seats are filling up fast!

> Registration link: https://tinyurl.com/y67c854f



Benefit of IBPSA membership



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IBPSA-Switzerland

In the first week of September 2019 IBPSA Switzerland was involved in two conferences. At BS 19 in Rome, IBPSA Switzerland was represented by Manuel Frey (President), Gerhard Zweifel (deputy Affiliate), and Christoph Stettler (newly elected Affiliate) to strengthen the network with our partners. At the CISPAT in Lausanne we organised a successful workshop on BIM2SIM and led two sessions.

In addition to this, we are involved in the topic BIM2SIM and BIM2FM together with partner associations (buildingSMART CH / Bauen Digital Schweiz). For example, we are helping to introduce model-based certification. A working group has been set up for this purpose.

All news on our activities can now be found on LinkedIn under IBPSA Switzerland.

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For additional information about IBPSA, please visit the Association's web site at **www.ibpsa.org**. For information on joining, contact your nearest regional affiliate.

IBPSA's mailing list has been consolidated into another listserver known as BLDG-SIM, which is a mailing list for users of building energy simulation programs worldwide, including weather data and other software support resources. To **subscribe** to BLDG-SIM, to unsubscribe or to change your subscriber details, use the online forms at http://lists.onebuilding.org/listinfo.cgi/bldg-sim-onebuilding.org.

To post a message to all members, send email to **bldg-sim@lists.onebuilding.org**.

The BLDG-SIM list is provided by GARD Analytics. If you have any questions, please contact the list owner Jason Glazer at jglazer@gard.com or +1 847 698 5686.

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