Dmitry Ivanov

Building Physics Engineer

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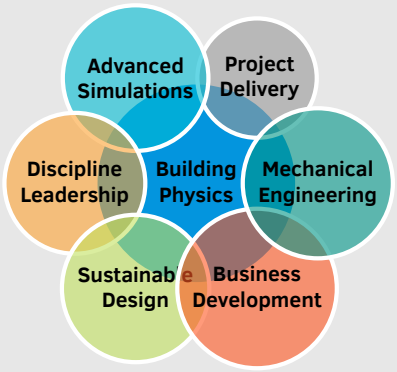
Skills

Overview



Tools

IES VE • Ladybug Tools

Energy Plus • Rhino + Grasshopper

OpenFOAM • PowerBI • LaTeX

Eddy3D • Pandas • Excel

Python • SimScale • DesignBuilder

ANSYS CFX \ Fluent • InDesign

Professional Profile

An enthusiastic and dedicated Chartered Engineer practising in an intersection of building physics, mechanical engineering and sustainability. Combines practical building performance analysis, environmentally sustainable design and mechanical design experience with a strong academic background.

Enjoys being part of, as well as leading, a successful and productive team demonstrating the motivation and multi-tasking abilities required to meet demanding deadlines while maintaining the highest of standards. Quick to develop efficient project-tailored workflows utilising cutting-edge research and first principles to develop out-of-the-box solutions to complex problems.

Committed to the field of high-performance buildings and precincts with the aim of helping clients to make informed decisions through a comprehensive analysis of the energy, cost and environmental factors.

Experience

Apr 2024 - date — **Building Physics Lead Australia** — Mott MacDonald (Melbourne, Australia)

- Leading a national team specialising in building physics
- Supporting business development initiatives for Engineering Sciences services nationwide
- Connecting gobally with building physics discipline leaders
- Overseeing major building physics projects, including energy analysis for buildings and precincts, microclimate assessments, daylight and glare evaluations, as well as passive and parametric design
- Managing technical excellence initiatives, encompassing training, lessons learned, and innovation
- Collaborating with state and national mechanical teams to address complex technical challenges and create opportunities for synergy between mechanical and building physics teams
- Cultivating client relationships through the delivery of exceptional work, consistently meeting and exceeding expectations
- Defining technical offerings and developing innovative workflows to maintain a competitive edge
- Conducting comprehensive building physics studies related to heat transfer, energy use, and fluid dynamics

Jan 2023 - Apr 2024 — **Principal Sustainability Engineer** — Mott MacDonald (Melbourne, Australia)

- Conducted microclimate analysis of cut-and-cover station topology, resulting in significant optimisation of mechanical systems, improved thermal comfort, and energy savings
- Developed a rapid energy analysis approach for compliance verification and benchmarking of over-station developments
- Created a comprehensive workflow for outdoor thermal comfort assessment to inform urban design
- Achieved finalist status in the One Mott MacDonald Awards for the innovative microclimate workflow
- Performed an extensive microclimate analysis of an art gallery using an in-house buoyant humidity solver, accounting for radiant heat transfer and complex air supply through whirl diffusers

Apr 2021 - Jan 2023 — **Senior Sustainability Engineer** — Mott MacDonald (Melbourne, Australia)

- Advised on engineered natural ventilation, optimising the size and location of openings for the major art gallery project
- Conducted detailed transient CFD simulations of the innovative metro tunnel system, providing radiant cooling for train brakes
- Employed a novel thermal comfort mapping technique to visually represent areas prone to overheating of the major airport project

Projects

National Gallery of Victoria – Contemporary (VIC)

Extensive analysis and guidance on the mixed-mode ventilation strategy; Microclimate and air quality analysis of the Arrival Gallery and support of the mechanical design.

Sydney Metro West (NSW)

Detailed bespoke simulaiton of thermal comfort and optimisation of mechanical systems for all underground stations of the West line. Energy analysis of the over station development.

Changi Airport T5 (Singapore)

Pollutant dispersion simulation and advisory on mechanical exhaust strategy. Thermal comfort analysis of the critical areas of the Ground Transportation Centre.

New Sydney Fish Market (NSW)

Supported Infrastructure New South Wales as technical advisor by reviewing thermal comfort analysis reports from external engineering consultancies.

NEOM Planning Guidelines (Saudi Arabia)

Lead subject matter expert for developing outdoor thermal comfort planning guidelines for NEOM region.

Northshore Hamilton Athlete Village (QLD)

Precinct energy strategy, including district thermal plant, renewable energy, and building performance optimisation.

Hudayriyat Velodrome (UAE)

Energy simulation and advisory for LEED and Pearl certifications. Support of the mechanical design on indoor microclimate and energy efficiency.

Monash University Campus Electrification (VIC)

Energy and Data Analysis for the electrification of the gas-fired heating and domestic water systems. Developing energy, cost and carbon performance analytics.

Oct 2020 - Apr 2021 **Senior Sustainability Consultant** SD Consultants (Melbourne, Australia)

- Benchmarking and reporting for NCC Part J, Green Star, NABERS, BESS; Detailed simulation of the HVAC systems
- Liaison with the design team on the measures necessary to meet the sustainability targets
- Developed templates of the detailed HVAC systems for Green Star certification for both the baseline and proposed design

Apr 2020 - Oct 2020 **Building Physics Engineer** Sole trader (Melbourne, Australia)

- Acquired a WELL AP accreditation and completed a WELLv2 Daylight and Thermal comfort project during the COVID-19 lockdown
- Independently carried out projects of an outdoor microclimate simulation and WELLv2 daylight and thermal comfort analysis

Jan 2019 - Jan 2020 **Building Physics Lead** APEX project bureau (Moscow, Russia)

- Performing building performance simulation to facilitate energy-efficient, human-centric and cost-effective design
- Rendering leadership and support to a diligent team and motivating them towards the achievement of objectives
- Improving indoor environmental quality by providing design solutions for optimal thermal and visual comfort conditions
- Carrying out energy modelling to optimise mechanical systems and building envelope as well as implement passive strategies
- Established a new branch of services and assembled a talented engineering team to provide the company with a competetive edge
- Researched and developed simulation workflows related to building physics and parametric design

Mar 2018 - Jan 2019 **Building Physics Lead / Product Manager** ENGEX (Moscow, Russia)

- Bridging the gap between the Client's business goals and engineering design with Building Performance services
- Responsibly delivering services for LEED certification starting from the preliminary analysis till the project completion
- Devised a new approach for a concept project stage featuring multivariable optimisation and wind comfort studies

Dec 2014 - Mar 2018 **Building Physics Lead** ENGEX (Moscow, Russia)

- Proposed a natural ventilation strategy for a LEED Platinum project, resulting in the elimination of mechanical ventilation system
- Successfully collaborated with Krean company in Bilbao, Spain on design of a new refrigeration facility for Liebherr company
- Performed CFD studies of displacement ventilation in an industrial facility, resulting in 45% energy costs savings for HVAC systems
- Advised on cooling plant optimisation, leading to $35,000 annual energy cost savings of the Entertainment and Recreational Complex

Jun 2013 - Dec 2014 **Senior Mechanical/Build. Phys. engineer** ENGEX (Moscow, Russia)

- Devised and simulated passive cooling strategies for the Kindergarten resulting in the elimination of the mechanical cooling system
- Carried out CFD simulation of the volleyball stadium, which led to increased thermal comfort and energy consumption reduction
- Pioneered an integration of building performance simulation into the design process

Aug 2011 - Jun 2013 **Mechanical Engineer** ENGEX (Moscow, Russia)

- Designed HVAC systems for Baker & McKenzie Company's office in Moscow, which later won the Best Office Award
- Developed an energy model of the private passive house project using eQuest and Ecotect Analysis

Projects(cont.)

Armstrong Creek Sports Centre (VIC)

Microclimate simulation and advisory for the centre's outdoor area. Energy, daylight and glare modelling for Green Star certification.

Adelaide Festival Plaza – Tower 2 (SA)
Wind Comfort and Safety Computational Fluid Dynamics model; developing control strategies to mitigate the adverse wind effects.

Yandex Headquarters (Russia)

Dynamic thermal and daylight simulation; extensive analysis of the cooling loads; documentation for BREEAM certification; collaboration with PLP Architecture.

Redevelopment of Badaevskiy Brewery (Russia)

Parametric simulation of the building's facade; thermal simulation of structural details; exterior CFD analysis of pollutant dispersion; energy modelling of the whole mixed-use complex designed by Herzog & de Meuron.

Sensorium Hall (Russia)

Energy and indoor air quality consulting; CFD analysis of the swimming pool, restaurant, thermal complex, and art gallery spaces.

AMPO Industrial facility (Spain)

Energy and daylight simulation for the LEED Gold project. CFD studies of the displacement ventilation strategy.

The Hexagon Art Gallery (Russia)

Indoor environment simulation of the spaces with precise requirements for thermal conditions. Energy modelling of advanced mechanical equipment.

Redevelopment of the Polytechnic Museum (Russia)

Thermal comfort analysis for two large atrium spaces using CFD modelling. Supporting fire dynamics, smoke control, and evacuation simulations.

Education

2011 - 2016 **Ph.D., Mechanical Engineering** Moscow State University of Civil Engineering
Thesis: Calculation of basement heat loss via simulation of transient three-dimensional temperature distribution in soil and constructions.

2006 - 2011 **Eng., Mechanical Engineering** Moscow State University of Civil Engineering
Ph.D. and Engineer's degrees have been assessed as equivalent to Australian degrees by Engineers Australia

Certifications

2022 - date **Registered Professional Engineer (Mech.)** Consumer Affairs Victoria

2022 - date **Chartered Professional Engineer (Mech.)** Engineers Australia

2016 - date **Building Energy Modeling Professional** ASHRAE

2016 - date **Building Performance Analysis Certificate** Autodesk

2020 - 2023 **WELL AP** GBCI

2013 - 2023 **LEED Green Associate** GBCI

Industry Participation

2024 - date **Energy & Carbon Expert Reference Panel** GBCA

Sep 2024 **Zak World of Facades Conference Speaker** Zak WoF

June 2023 **Green Building Day Conference Speaker** GBCA

2022 - 2023 **Building Simulation 2023 Conference: Paper Reviewer** IBPSA

2020 - 2023 **BEMP Exam Subcommittee** ASHRAE

Publications

Ivanov, D., et al. "Enhancing Campus Quality: A Focus on Microclimate." *Australasian Universities Building Education Association 2024 Conference*. 2024 [forthcoming].

Ivanov, D. "Streamlined Urban Thermal Comfort simulation workflow". *Proceedings of Building Simulation 2023: 18th Conference of IBPSA*. 2023.

Ivanov, D., Yakimchuk, O., Pastukhov, I. "Heating of staircases in high-rise buildings". *Proceedings of Building Simulation 2019: 16th Conference of IBPSA*. 2019.

Memberships

2021 - date **Member of Engineers Australia** Engineers Australia

2018 - date **International Building Performance Simulation Association** IBPSA
Founding member of affiliated regional association IBPSA-Russia

2016 - 2021 **American Society of Heating, Refrigerating and Air-Conditioning Engineers** ASHRAE

References are available on request