JOSHUA VASUDEVAN

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SUMMARY

I am a Doctoral Researcher in the Building Energy Research Group with around four years of experience in the building industry. I am a highly motivated individual with a strong background in building energy and artificial intelligence. Through my experience, I have developed a deep understanding of the intersection between these two fields and the potential for cutting-edge technologies to revolutionize the way we live and work. I am dedicated to pushing the boundaries of what is possible, and I thrive in dynamic, fast-paced environments where innovation is the norm.

EXPERTISE

- Sustainable Building Design
- Building Information Modelling
- Control systems
- Energy Auditing

- Net zero buildings
- Building Energy Management System
- Machine Learning
- Energy modelling

- Building Performance analysis
- Indoor Environmental Quality
- Data analysis

TECHNICAL SKILLS

- **Building Analysis Software**: IES VE, DesignBuilder, Energyplus, Sefaira, One Click LCA tool
- **Design Software**: Revit Architecture, Revit MEP, AutoCAD, 3Ds Max, Sketchup, McQuay, Dialux 4.0
- **Project Management Software:** Primavera, Microsoft Project, BIM 360, Navisworks
- **Programming Language:** MATLAB, Python
- **Database:** MySQL
- **Data visualisation:** Grafana, Tableau, PowerBI
- **Graphics Software**: Adobe Photoshop, Adobe Illustrator, Corel Draw.
- **Certifications**: Niagara 4 Certification, BREEAM AG, MEP certification in HVAC, Electrical and Revit MEP.

SOFT SKILLS

- Communication, Teamwork, Time management, Problem-Solving, Creativity, Leadership, Critical Thinking

WORK EXPERIENCE

- **Teaching Assistant, Loughborough University, Loughborough**   Oct 2020 – Present
  - Teaching Building Energy Networks & IES VE for the Postgraduate students
  - Develop and teach Low Energy Building Design module for Postgraduate students
  - Lecture on decarbonisation, net zero carbon designs, BREEAM, and passivhaus principles.
  - BIM (Revit, Navisworks) Tutorial lessons for Undergraduate students.

- **Doctoral Innovation Consultant, Loughborough University, Loughborough**   Apr 2022 – Aug 2022
  - Worked closely with start-up companies in the incubators.
  - Help with market research for the start-ups.
  - Analyse their business model and give feedback on future improvements.

- **Research Intern, Mitsubishi Electric R&D Europe, Livingston, Scotland.**   Oct 2019 – Jan 2020
  - Monitor and analyse Indoor Environmental Quality of the office buildings.
  - Analyse the data from sensors to evaluate the performance of the indoor environment.

- **Project Engineer, Creative Eden Trading LLC., Muscat, Sultanate of Oman.**   Nov 2016 – Jun 2018
  - Designed Architectural, HVAC, Electrical and Fire Fighting drawings for retail shop fit outs.
  - Heat load calculation for HVAC, Duct routing and sizing.
  - Coordination with Clients and Mall Management for the design and execution of the fit-out works.
  - Estimated and prepared Bill of Quantities.

RESEARCH EXPERIENCE

- **Data-driven prediction of spatially distributed parameters and control of thermal comfort and IAQ in office buildings – PhD** **(Oct 2020 – Present)**
  - Continuous monitoring of IEQ in buildings using LORAWAN sensors.
  - Create ML models (ANN, XGBoost, RF) to predict the spatially distributed indoor parameters.
  - Develop an intelligent control algorithm to control thermal comfort and indoor air quality and reduce the uneven distribution of air temperature.

- **Predicting Thermal Comfort in Buildings using Thermal Imaging Technology (Oct 2018 – Sep 2019)**
  - Conduct pilot thermal comfort tests on participants utilising surveys and thermal images.
  - Draw relationships between thermal images and the thermal sensation of occupants.
  - Developed an IES model of an existing building and analyse the energy savings of using the developed thermal comfort model by regulating HVAC operation.

ACADEMIC PROJECTS

Solar Decathlon 2022 **Oct 2022 – Apr 2023**
- Design a net zero semidetached house in the UK for DOE US Solar Decathlon.
- Used genetic algorithm optimisation to optimise the building variables to minimise heating and cooling loads.
- Analysed climate and used Design builder for Energy analysis and daylighting.
- Used One-click LCA tool for embodied carbon analysis.

ASHRAE Energy Quotient Competition 2022 **Oct 2021 – Apr 2022**
- Conducted energy audit of a hospital building in Derby for the ASHRAE Building EQ competition.

ASHRAE Design Competition 2019 **Oct 2018 – May 2019**
- Designed a net zero energy hospital building in Budapest, Hungary, for the ASHRAE competition.
- Analysed climate and natural ventilation potential in Budapest, Hungary
- Developed Energy model in IES VE for Energy analysis and IES Radiance for daylighting.
- Used One-click LCA tool for embodied carbon analysis and Revit Archi and MEP for design.

Low Energy Building Design **Apr 2019**
- Design a low-energy commercial office building using IES VE with less demand for space cooling and heating and increased use of natural ventilation using the Passivhaus design strategy.

Building Energy System design for Hospital **Apr 2019**
- Develop a Revit model of Hospital building and design building services in Revit MEP.

Building Information Modelling **Apr 2019**
- Design a commercial office building and do clash detection for Architectural, Structural and MEP in Navisworks and workflow management in CDE.

HVAC design for Swimming pool **Dec 2018**
  - Developed design criteria and designed HVAC system for swimming pool for winter condition.

EDUCATION

Doctoral Researcher, Building Energy Research Group
Loughborough University, Loughborough, United Kingdom **Oct 2020 – Sep 2023**

Masters in Low Energy Building Services Engineering (Grade – 1st)
Loughborough University, Loughborough, United Kingdom **Oct 2018 – Sep 2019**
Key Modules: Low Energy Building Design | Control and Commissioning for Low Energy Buildings | Building Thermal Loads and Systems | Wellbeing and Indoor Environment | Building Energy Supply systems and District Energy Networks | Thermal Modelling in BIM | Federated BIM | Electrical Systems Buildings and Renewable Energy

ACHIEVEMENTS

- Won **ASHRAE YEA Developing Leader Award 2022**.
- Won **1st place** in the **ASHRAE Building EQ Competition 2022**.
- Top 5 in **HVAC World Student Competition 2020**.
- Won **2nd runner-up** in **CIBSE ASHRAE Graduate of the year 2020**.
- Won **1st place** in the **ASHRAE HVAC&R Student Paper Competition 2020**.
- Won **1st place** in the **ASHRAE International Design Competition 2019** in the **Integrated Sustainable Building Design** category.
- Won **1st place** in the **ASHRAE UK Midlands MSc Research Competition 2019.**
- Won **AECOM Best Student performer of the year 2019** during Master's course at Loughborough University.
- Won third place for effectively designing a CAD model of a building under given time and design constraints in **'Cadd Contest'** in 2015.

PROFESSIONAL AFFILIATIONS

- Graduate Member in Chartered Institution of Building Services Engineers (**CIBSE**) since 2019.
- Committee member CIBSE East Midlands and Scotland.
- Associate Member in American Society of Heating, Refrigerating and Air Conditioning Engineers (**ASHRAE**) since 2019.
- President-Elect, ASHRAE UK Chapter (2022 – 23) & Regional Vice Chair – YEA, Region XIV (2020 – 26).
- Corresponding Member ASHRAE Technical Committee 4.3 (Ventilation), 4.10 (Indoor Environmental Modelling), 7.5 (Smart Buildings).
- Member of International Building Performance Simulation Association England (**IBPSA**) since 2019.

PUBLICATIONS

- Conference papers
  - **Vasudevan, J.**, Coakley, D., Angelopoulos, C., Jephson, G., Rastogi, P., Sobek, O. N., Jephson, G., Eftekhari, M. and Dimitriou, V. (2021) '*Monitoring Indoor Environmental Quality (IEQ) in Buildings with Distributed Sensing*', in IAQ 2020: Indoor Environmental Quality Performance Approaches. American Society of Heating Refrigerating and Air-Conditioning Engineers, pp. 1–8.

- Journal papers
  - Jeyakumar, S. S., Ponniah, J. M., **Vasudevan, J**., Munoz-Sevilla, N. P., Urrutia-Goyes, R., Escobedo-Urias, D. C. and Rodriguez-Espinosa, P. F. (2023) '*Public views on tourist beach environment from multinational countries and ensuing changes during global epidemic*', Environmental Science and Pollution Research. doi: https://doi.org/10.1007/s11356-023-26277-x.

REFEREES

- **Prof. Mahroo Eftekhari**, Professor of Building Services, School of Architecture Building and Civil Engineering, Loughborough University, UK, *Tel*: +44 (0)1509 222606, *Email*: m.m.eftekhari@lboro.ac.uk

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- **Dr. Steven Firth**, Reader in Building Performance Modelling, School of Architecture Building and Civil Engineering, Loughborough University, UK, *Tel*: +44 (0)1509 228546, *Email*: s.k.firth@lboro.ac.uk