

# Miguel Martin

POSTDOCTORAL RESEARCH FELLOW · MARIE SKLODOWSKA-CURIE GLOBAL PROGRAM

Delft University of Technology, Julianalaan 134, 2628 BL Delft, Netherlands

✉ M.Martin@tudelft.nl | 🏠 miguelmartin.org

## Education

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### National University of Singapore

Singapore

PH.D. BUILDING SCIENCE

2016 - 2021

- Advisor: Prof. WONG Nyuk Hien
- Thesis: *Physically-based modelling of interactions between a building and its outdoor conditions at the urban microscale*

### University of Geneva

Geneva, Switzerland

M.SC. COMPUTER SCIENCE

2009 - 2011

- Advisor: Prof. PUN Thierry
- Master Thesis: *Biometric authentication using human brain activity*

### University of Geneva

Geneva, Switzerland

B.SC. COMPUTER SCIENCE

2005 - 2009

## Research Experience

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- 2023-Now **Visiting Postdoctoral Researcher**, Dept. of Civil and Environmental Engineering, Carnegie Mellon University
- 2022-Now **Postdoctoral Research Fellow**, Dept. of Urbanism, Delft University of Technology
- 2020-2022 **Senior Research Fellow**, Berkeley Education Alliance in Singapore
- 2015-2016 **Research Fellow**, Dept. of Building, National University of Singapore
- 2015 **Visiting Researcher**, Dept. of Building Technology, Massachusetts Institute of Technology
- 2013-2015 **Research Engineer**, Dept. of Engineering Systems and Management, Masdar Institute of Science and Technology
- 2011-2012 **Research Assistant**, Energy Centre, Ecole Polytechnique Federal de Lausanne

## Publications

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### JOURNALS

- Martin, M.**, Ramani, V. and Miller, C., 2024. InfraRed Investigation in Singapore (IRIS) Observatory: Urban heat island contributors and mitigators analysis using neighborhood-scale thermal imaging. *Energy and Buildings*, p.113973.
- Ramani, V., **Martin, M.**, Arjunan, P., Chong, A., Poolla, K. and Miller, C., 2023. Longitudinal thermal imaging for scalable non-residential HVAC and occupant behaviour characterization. *Energy and Buildings*, 287, p.112997.
- Martin, M.**, Chong, A., Biljecki, F. and Miller, C., 2022. Infrared thermography in the built environment: A multi-scale review. *Renewable and sustainable energy reviews*, 165, p.112540.
- Miguel, M.**, Hien, W.N., Marcel, I., Chung, H.D.J., Yueer, H., Zhongqi, Y., Ji-Yu, D., Raghavan, S.V. and Son, N.N., 2021. A physically-based model of interactions between a building and its outdoor conditions at the urban microscale. *Energy and Buildings*, 237, p.110788.
- Lim, T.K., Wong, N.H., Ignatius, M., **Martin, M.**, Juang, H.M.H., Lou, J. and Tiong, R.L.K., 2021. Singapore: an integrated multi-scale urban microclimate model for urban planning in Singapore. *Urban Climate Science for Planning Healthy Cities*, pp.189-217.
- Wong, N.H., He, Y., Nguyen, N.S., Raghavan, S.V., **Martin, M.**, Hii, D.J.C., Yu, Z. and Deng, J., 2021. An integrated multiscale urban microclimate model for the urban thermal environment. *Urban Climate*, 35, p.100730.
- Lim, T.K., Ignatius, M., **Miguel, M.**, Wong, N.H. and Juang, H.M.H., 2017. Multi-scale urban system modeling for sustainable planning and design. *Energy and Buildings*, 157, pp.78-91.

**Martin, M.**, Wong, N.H., Hii, D.J.C. and Ignatius, M., 2017. Comparison between simplified and detailed EnergyPlus models coupled with an urban canopy model. *Energy and Buildings*, 157, pp.116-125.

**Martin, M.**, Afshari, A., Armstrong, P.R. and Norford, L.K., 2016. A new validation protocol for an urban microclimate model based on temperature measurements in a Central European city. *Energy and Buildings*, 114, pp.38-53.

**Martin, M.**, Afshari, A., Armstrong, P.R. and Norford, L.K., 2015. Estimation of urban temperature and humidity using a lumped parameter model coupled with an EnergyPlus model. *Energy and Buildings*, 96, pp.221-235

## CONFERENCE PROCEEDINGS

**Martin, M.**, Wong, N.H. and Ichinose, M., 2019, July. Impact of retro-reflective glass façades on the surface temperature of street pavements in business areas of Singapore and Tokyo. In *IOP Conference Series: Earth and Environmental Science* (Vol. 294, No. 1, p. 012020). IOP Publishing.

## Awards, Fellowships & Grants

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### AWARDS

2019 **Best paper award**, Sustainable Built Environment Conference, Tokyo (Japan)

2019 **Best oral presentation**, Sustainable Built Environment Conference, Tokyo (Japan)

### FELLOWSHIPS AND GRANTS

2022 **Marie Skłodowska-Curie Postdoctoral Fellowship**, European Commission *EUR 297,000*

2019 **President's Graduate Fellowship**, National University of Singapore *EUR 72,000*

2018 **Virtual Singapore at 3D City Modelling**, National Research Foundation (NRF) of Singapore *EUR 670,000*

2016 **NUS Research Scholarship**, National University of Singapore *EUR 61,000*

### OTHER ACHIEVEMENTS AND ACTIVITIES

2024 **Chair session**, eSim, Edmonton (Canada)

## Presentations

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### INVITED TALKS

June 17 2024. *Machine Learning Applied to Urban Building Energy Modelling and Climate Risk Assessment*. ClimateChange.AI (CCAI) discussion seminar series No. 1.

March 25 2024. *Updates on Urban Heat Islands studies for the Marie Curie fellowship*. BUDS Lab seminar, National University of Singapore, Singapore.

February 20 2023. *Smart City Innovations and Experiments using New Climate and Energy Simulations (SCIENCES)*. CAPS seminar, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States.

January 20 2023. *Smart City Innovations and Experiments using New Climate and Energy Simulations (SCIENCES)*. AIS seminar, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States.

April 2 2020. *Coupling EnergyPlus with urban canopy models*. Cooling Singapore seminar, Singapore-ETH Center, Singapore.

### CONFERENCES

**Martin, M.**, Berges, M., Stoter, J. E. and Garcia-Sanchez, C., Coupling between detailed building energy models and a data driven urban canopy model (oral), PLEA, 2024, Wroclaw (Poland)

**Martin, M.**, Berges, M., Stoter, J. E. and Garcia-Sanchez, C., Impact of interactions between buildings and their outdoor conditions on the calibration of an urban building energy model (oral), eSim, 2024, Edmonton (Canada)

**Martin, M.**, Wong, N.H. and Ichinose, M., Impact of retro-reflective glass façades on the surface temperature of street pavements in business areas of Singapore and Tokyo (oral), Sustainable Built Environment Conference, 2019, Tokyo (Japan)

**Martin, M.**, Hii, D. J. C., Ignatius, M., and Wong, N. H., Comparison between a simplified and detailed building energy model coupled with an urban canopy model (oral), 4th International Conference on Countermeasures to Urban Heat Island, 2016, Singapore

- Martin, M.**, Hii, D. J. C., Ignatius, M., and Wong, N. H., Predictability of urban air temperature changes from variations of PM2.5 concentration during the 2015 Southeast Asian transboundary haze episode (oral), 4th International Conference on Countermeasures to Urban Heat Island, 2016, Singapore
- Martin, M.**, Afshari, A., Norford, L. K., Parlow, E., and Vogt, R., Validation of a lumped thermal parameter model coupled with an EnergyPlus model using BUBBLE data (oral), 9th International Conference on Urban Climate, 2015, Toulouse (France)
- Martin, M.**, Afshari, A., Armstrong, P. R., and Marpu, P. R., MOBO—An experimental network for urban heat island analysis in a green district of the Middle-East (poster), 9th International Conference on Urban Climate, 2015, Toulouse (France)
- Martin, M.**, Afshari, A., Armstrong, P. R., and Norford, L. K., Validation of a coupled scheme urban canopy model and building simulator (oral), 3rd International Conference on Countermeasures to Urban Heat Island, 2014, Venice (Italy)

## Teaching Experience

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- Spring  
2024 **Autonomous and sustainable buildings**, co-Instructor, Carnegie Mellon University
- Spring 2019 **Digital construction**, Teaching Assistant, National University of Singapore
- Spring 2010 **Project in Software Engineering**, Teaching Assistant, University of Geneva
- Fall 2009 **Software Engineering**, Teaching Assistant, University of Geneva