Matias Alberto Quintana Rosales

Email: matias.quintana@sec.ethz.ch
Phone: +65 9246 5603

Work & Research Experience

- **Singapore-ETH Centre** — Singapore, SG
  Postdoctoral Researcher and Module Coordinator — *04/2023 – Present*
  - **Project Management**: Led and managed team of 6 researchers across Singapore and Zurich.
  - **Data Science**: Guided Ph.D. students and visiting scholars regarding machine learning and data science projects at the building and urban level.
  - **Industrial research**: Collaborated with government agencies and industry partners for AI-based solutions at the urban scale.
- **College of Design and Engineering, National University of Singapore** — Singapore, SG
  *Postdoctoral Research Fellow (**BUDSLab**)* — *08/2022 – 03/2023*
  - **Field experiments**: Led field studies with wearable technology for health and thermal comfort monitoring.
  - **Data Science**: Lab research and development manager, handled machine learning and data science projects at the building and urban level.
- **College of Design and Engineering, National University of Singapore** — Singapore, SG
  *Graduate Research Assistant (**BUDSLab**, **SinBerBEST2**)* — *08/2018 – 08/2022*
  - **Field experiments**: Conducted field studies with wearable technology for health and thermal comfort monitoring.
  - **Data Science**: Performed unsupervised and semisupervised learning research on a global portfolio of building electricity consumption and on field experiment datasets for thermal comfort. Main collaborator and content creator for MOOC **Data Science for Construction Architecture and Engineering** (**2021 edX Prize Finalist for Innovation in Online Teaching**).
  - **Hardware & Software**: Organized and maintained laboratory computational resources used for scientific research.
- **Civil and Environmental Engineering Dept., Carnegie Mellon University** — Pittsburgh, US
  Graduate Research Assistant, Intelligent Insfrastructure Research Lab (INFERLab) — *04/2017 – 06/2018*
  - **Industrial research**: Collaborated in Department of Energy funded project regarding Sensing and Control for Commercial Building Energy Efficiency and Occupant Comfort.
  - **Data Science**: Designed and implemented a data preparation and evaluation framework with Bosch U.S. research scientists for RGBD building occupancy data.
  - **Hardware**: Designed, produced, and programmed an AC waveform power meter board based on an Atmega328p for the Raspberry Pi.
- **VIT Initiative, LLC. (Acquired by SWORD Health)** — Pittsburgh, US
  Firmware & Mobile Developer — *12/2017 – 06/2018*
  - **Product development**: Assembled, tested, and performed demonstration of fully finalized commercial product on clients' site and funding events.
  - **Data Science**: Developed data collection pipeline for Internet of Things (IoT) devices, mobile devices, and web servers.
  - **Software**: Designed and developed mobile application functionality and user interface for IoT sensor and web server interaction.
- **Banking Commission of the Republic of Marshall Islands** — Majuro, MH
  Intern, Technology Consultant — *05/2016 – 07/2016*
  - **Consulting**: Assessed current state of technology infrastructure and information management and provided recommendations (comprehensive **final report**)
  - **Software**: Designed, proposed, and implemented data collection and analysis solution for the Financial Intelligence Division.

Teaching & Mentoring Experience

- **Singapore-ETH Centre** — Singapore, SG
  Postdoctoral Researcher — *04/2023 – Present*
  - **Mentoring**: Mentored **3** Ph.D. students in research projects and their theses.
- **College of Design and Engineering - National University of Singapore** — Singapore, SG
  Teaching assistant — *08/2020 – 03/2023*
  - **Mentoring**: Mentored **11** B.Sc., **2** M.Sc., and **3** Ph.D. students in research projects and their theses.
  - **Online teaching**: Main collaborator and content creator for MOOC **Data Science for Construction Architecture and Engineering** (**2021 edX Prize Finalist for Innovation in Online Teaching**).
  - **Courses PF1103 - Digital Construction, PF3211 - AI Applications for the Built Environment, BPS5229 - Data Science for the Built Environment**: Held office hours and taught hands-on sessions.
- **Heinz College - Carnegie Mellon University** — Pittsburgh, PA
  Teaching Assistant — *08/2016 – 12/2016*
  - **Course 95-703 - Database Management**: Held office hours and laboratory sessions to help students with assignments and class' concepts, improved assignments, and designed new homeworks

Education

- **National University of Singapore (Singapore): *Ph.D. Engineering*** 2018-2022
  Thesis: Cohort-based Personal Comfort Models for HVAC Occupant-Centric Control
- **Carnegie Mellon University (USA): *Master of Info. Sys. Mngmt.*** 2015-2016
  Modules: Data Mining; Machine Learning; Data Structures and Algorithms
- **Pontifical Catholic University of Peru (Peru): *B.Sc. Electronic Eng.*** 2009-2014
  Modules: Electronic Design; Computer Architecture; Web Technologies

Publications

- **As of April 6, 2023; H-index: 9; Citations: 323**
- **Journals**

5. Quintana, M., Schiavon, S., Tartarini, F., Kim, J., & Miller, C. (2023). Cohort comfort models—Using occupant's similarity to predict personal thermal preference with less data. Building and Environment, 227, 109685. https://doi.org/10.1016/j.buildenv.2022.109685
4. Tartarini, F., Schiavon, S., Quintana, M., & Miller, C. (2022). Personal comfort models based on a 6-month experiment using environmental parameters and data from wearables. Indoor Air, 32(11). https://doi.org/10.1111/ina.13160
3. Quintana, M., Stoeckmann, T., Park, J. Y., Turowski, M., Hagenmeyer, V., & Miller, C. ALDI++: Automatic and parameter-less discord and outlier detection for building energy load profiles. Energy & Buildings, 265, 112096. (2022). https://doi.org/10.1016/j.enbuild.2022.112096
2. Jayathissa, P., Quintana, M., Abdelrahman, M., & Miller, C. Humans-as-a-sensor for buildings: Intensive longitudinal indoor comfort models. Buildings, 10(174), 1–23. (2020). https://doi.org/10.3390/buildings10100174
1. Quintana, M., Arjunan, P., & Miller, C. Islands of misfit buildings: Detecting uncharacteristic electricity use behavior using load shape clustering. Building Simulation, October, 1–12. (2019). https://doi.org/10.13140/RG.2.2.11489.86883

- **Conferences**

21. Quintana, M., Nagy, Z., Tartarini, F., Schiavon, S., & Miller, C. (2022). ComfortLearn: Enabling agent-based occupant-centric building controls. Third ACM SIGEnergy Workshop on Reinforcement Learning for Energy Management in Buildings & Cities (RLEM) (RLEM '22), 4. https://doi.org/10.1145/3563357.3566167
20. Miller, C., Chua, Y. X., Frei, M., & Quintana, M. (2022). Towards smartwatch-driven just-in-time adaptive interventions (JITAI) for building occupants. The 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys '22), 4. https://doi.org/10.1145/3563357.3566135
19. Zhan, S., Quintana, M., Miller, C., & Chong, A. (2022). From Model-Centric to Data-Centric: A Practical MPC Implementation Framework for Buildings. BuildSys '22 Proceedings of the 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation, 4. https://doi.org/10.1145/3563357.3564077
18. Teo, Y. T., Quintana, M., Bin, M. Z., Tan, C., Chong, A., & Miller, C. (2022). Dataset: Green Mark certified buildings metadata from Singapore. The Fifth International Workshop on Data: Acquisition To Analysis (DATA '22), 4. https://doi.org/10.1145/3560905.3567771
17. Quintana, M., Abdelrahman, M., Frei, M., Tartarini, F., & Miller, C. Longitudinal Personal Thermal Comfort Preference Data in the Wild. Proceedings of the 19th ACM Conference on Embedded Networked Sensor Systems, 556–559. (2021). https://doi.org/10.1145/3485730.3493693
16. Quintana, M. Cohort-Based Personal Comfort Models for HVAC Occupant-Centric Control. Proceedings of the 8th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation, 242–243. (2021). https://doi.org/10.1145/3486611.3492386
15. Nazarian, N., Liu, S., Kohler, M., Lee, J. K. W., Miller, C., Chow, W. T. L., Alhadad, S. B., Martilli, A., Quintana, M., Sunden, L., & Norford, L. K. Project Coolbit: Can your watch predict heat stress and thermal comfort sensation? Environ. Res. Lett., 16. (2021). https://doi.org/10.1088/1748-9326/abd130
14. Miller, C., Abdelrahman, M., Chong, A., Biljecki, F., Quintana, M., Frei, M., Chew, M., & Daniel, W. The Internet-of-Buildings (IoB) – Digital twin convergence of wearable and IoT data with GIS / BIM. CISBAT 2021 - Carbon Neutral Cities - Energy Efficiency & Renewables in the Digital Era, EPFL, July. (2021). https://doi.org/10.1088/1742-6596/2042/1/012041
13. Sae-Zhang, P., Quintana, M., & Miller, C. Differences in thermal comfort state transitional time among comfort preference groups. 16th Conference of the International Society of Indoor Air Quality and Climate: Creative and Smart Solutions for Better Built Environments, Indoor Air 2020, November. (2020).
12. Quintana, M., Schiavon, S., Tham, K. W., & Miller, C. Balancing thermal comfort datasets: We GAN, but should we? In Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (pp. 120–129). Virtual Event, Japan. (2020). https://doi.org/10.1145/3408308.3427612

11. Sood, T., Quintana, M., Jayathissa, P., Abdelrahman, M., & Miller, C. The SDE4 Learning Trail: Crowdsourcing occupant comfort feedback at a net-zero energy building. CISBAT2019 Climate Resilient Buildings - Energy Efficiency & Renewables in the Digital Era. (2019). https://doi.org/10.13140/RG.2.2.33265.12644
10. Quintana, M., & Miller, C. Poster Abstract: Towards Class-Balancing Human Comfort Datasets with GANs. BuildSys '19 Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Built Environments. (2019). https://doi.org/10.1145/3360322.3361016
9. Nazarian, N., Miller, C., Norford, L., Kohler, M., Chow, W., Kai, J. L., Alhadad, S. B., Quintana, M., Sunden, L., & Martilli, A. Project CoolBit Updates: Personal Thermal Comfort Assessments using Wearable Devices. Geophysical Research Abstracts, 21, 13042. (2019).
8. Munir, S., Francis, J., Quintana, M., Frankenberg, N. V., & Bergés, M. Dataset: Inferring Thermal Comfort using Body Shape Information Utilizing Depth Sensors. In ACM (Ed.), DATA'19 Proceedings of the 2nd Workshop on Data Acquisition To Analysis (pp. 13–15). (2019). https://doi.org/10.1145/3359427.3361915
7. Miller, C., Quintana, M., & Glazer, J. Twenty years of building simulation trends: Text mining and topic modeling of the BLDG-SIM email list archive topic modeling of the BLDG-SIM email list archive. IBPSA2019 Proceedings of the International Building Performance Simulation Association. (2019). https://doi.org/10.13140/RG.2.2.24955.46885
6. Francis, J.*, Quintana, M.*, Frankenberg, N. Von, Munir, S., & Bergés, M. OccuTherm: Occupant Thermal Comfort Inference using Body Shape Information. In BuildSys '19 Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Built Environments]. New York, NY, USA. (2019). https://doi.org/10.1145/3360322.3360858
5. Jayathissa, P., Quintana, M., Sood, T., Narzarian, N., & Miller, C. Is your clock-face cozie ? A smartwatch methodology for the in-situ collection of occupant comfort data. In CISBAT2019 Climate Resilient Buildings - Energy Efficiency & Renewables in the Digital Era. Lausanne, Switzerland. (2019).
4. Flores, F., Munir, S., Quintana, M., Prakash, A., & Bergés, M. Dataset: Occupancy Detection , Tracking , and Estimation Using a Vertically Mounted Depth Sensor. DATA'19 Proceedings of the 2nd Workshop on Data Acquisition To Analysis, 7–9. (2019). https://doi.org/10.1145/3359427.3361916
3. Quintana, M., Lange, H., & Bergés, M. Demo: Design and Implementation of a Low-cost Arduino-based High-Frequency AC Waveform Meter Board for the Raspberry Pi. BuildSys '17 Proceedings of the 4th ACM International Conference on Systems for Energy-Efficient Built Environments. (2017). https://doi.org/10.1145/3137133.3141441
2. Munir, S., Tran, L., Francis, J., Shelton, C., Singh Arora, R., Hesling, C., Quintana, M., Krishnan Prakash, A., Rowe, A., & Bergés, M. Demo: FORK: Fine grained Occupancy estimatoR using Kinect on ARM Embedded Platforms. BuildSys '17 Proceedings of the 4th ACM International Conference on Systems for Energy-Efficient Built Environments. (2017). https://doi.org/10.1145/3137133.3141461
1. Retamozo, S., Arce, D., Aguilar, R., Zvietcovich, F., Quintana, M., Castaneda, B., & Angeles, S. A comparison of digital modelling techniques analyzing a section of Qhapaq Ñan. 2015 Digital Heritage. (2015). https://doi.org/10.1109/DigitalHeritage.2015.7413856

Media

3. Net-Zero Energy buildings interview by French TV show, TF1, 2023
2. **Science Communication Outreach**, National University of Singapore, 2023
1. Presenter and panelist at Workshop on Applications and Research in Data Science (**TARECDA**), 2022

Awards

- **Ph.D. Travel Fellowship**
  University of Nebraska-Lincoln (UNL), Future of the Building Industry (FOBI) Workshop, Nebraska U.S. *2022*
- **Innovation in Online Teaching Finalist**
  edX *2021*
- **Buildings Best Paper Award**
  Buildings MDPI Journal *2020*
- **Ph.D. Research Scholarship**
  National University of Singapore *2018*
- **Admission Scholarship**
  Heinz College, Carnegie Mellon University *2015*
- **Second Place Best Poster**
  Euromed: International Conference on Cultural Heritage *2014*

Services

- **Grants**
  - Climate Change AI - Reviewer (2023)
- **Journals**
  - Scientific Reports - Reviewer (2023)
  - Building Performance Simulation - Reviewer (2022)
  - Building Engineering - Reviewer (2022)
  - Ambient Intelligence and Humanized Computing - Reviewer (2021)
  - Building and Environment - Reviewer (2021)
  - Applied Energy - Assistant Reviewer (2020)
  - Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) - Reviewer (2020)
- **Conferences**
  - Workshop on Tackling Climate Change with Machine Learning at the International Conference on Learning Representations (ICLR) - Program Committee (2023)
  - ACM SIGEnergy Workshop on Reinforcement Learning for Energy Management in Buildings & Cities (RLEM) - Technical Program Committee Co-Chair (2021, 2022); Web Chair (2021)
  - ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys) - Organisation Committee (2021, 2022, 2023); Sponsorship Co-Chair (2021, 2022); Poster/Demo Co-Chair (2023); Student Volunteer (2020)
  - International Workshop on Applied Machine Learning for Intelligent Energy Systems (AMLIES) - Technical Program Committee (2020, 2021, 2022, 2023)
  - Workshop on Tackling Climate Change with Machine Learning at the Conference on Neural Information Processing Systems (NeurIPS) - Program Committee (2021, 2022)
  - Workshop on Tackling Climate Change with Machine Learning at the International Conference on Machine Learning (ICML) - Program Committee (2021)
  - eSim 2020 Building simulation meets building data, IBPSA Canada - Reviewer (2021)
  - ACM International Conference on Future Energy Systems (e-Energy) - Assistant Reviewer (2020)

University & Public Engagement

- **Access Singapore, NGO** — Singapore, SG
  Operations volunteer — *03/2023 - Present*
- **Global Young Scientists Summit, National Research Foundation** — Singapore, SG
  Participant and presenter — *01/2023*
- **Science Outreach Team, NUS** — Singapore, SG
  Presenter — *08/2022 - 03/2023*
- **Woodlands Social Centre** — Singapore, SG
  Volunteer and Consultant — *02/2022 - Present*
- **Office of the Senior Deputy President and Provost, NUS** — Singapore, SG
  Member of the National University of Singapore (NUS) Board of Discipline — *07/2021 - 06/2022*
- **Office of Student Affairs, NUS** — Singapore, SG
  Resident Assistant and Secretary — *06/2020 - 06/2022*
- **ASHRAE Student Branch, NUS** — Singapore, SG
  Secretary — *02/2020 - 05/2021*
- **Building Research Students Network, NUS** — Singapore, SG
  President; former Treasurer — *08/2019 - 07/2022*
- **Office of Student Affairs, NUS** — Singapore, SG
  Mentor at Teach with Heart@Tanglin Secondary School — *07/2019 - 10/2019*
- **Internet of Things Club, Carnegie Mellon University** — Pittsburgh, PA
  Co-founder and Technical Director — *06/2016 - 12/2016*
- **Latino Graduate Student Association, Carnegie Mellon University** — Pittsburgh, PA
  President; former Treasurer — *08/2015 - 12/2016*

Hobbies & Skills

- **Hobbies**: Weightlifting, running, playing string instruments, photography
- **Languages**: Spanish, English, French, Chinese
- **Programming & Scripting languages**: Python, Bash, SQL, JAVA, R, MATLAB, C/C++

References

- **Filip Biljecki** Email : filip@nus.edu.sg
  Assistant Professor, National University of Singapore
- **Clayton Miller** Email : clayton@nus.edu.sg
  Assistant Professor, National University of Singapore
- **Stefano Schiavon** Email : schiavon@berkeley.edu
  Professor, UC Berkeley
- **Mario Bergés** Email : marioberges@cmu.edu
  Professor, Carnegie Mellon University