

# Matias Quintana

PH.D. STUDENT · BUILDING TECHNOLOGY

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## Education

### National University of Singapore

PH.D. STUDENT AT THE SCHOOL OF DESIGN AND ENVIRONMENT

- National University of Singapore - Research Scholarship Holder
- Member of the Building and Urban Data Science Laboratory ([BUDS Lab](#))
- Part of the Singapore-Berkeley Building Efficiency and Sustainability in the Tropics 2 ([SinBerBEST2](#)) program
- Relevant Coursework: Building Energy Performance Active & Passive Systems, Neural Networks and Deep Learning

Singapore

2018 - Present

### Carnegie Mellon University

MASTER OF INFORMATION SYSTEMS MANAGEMENT

- Relevant Coursework: OOP in Java, Database Management, Distributed Systems, Data Mining, Data Structures for Application Programmers, Exploring & Visualizing Data, OO Analysis and Design, Linux & Open Source, Internet Technologies, Applied Machine Learning

Pittsburgh, PA

2015 - 2016

### Pontifical Catholic University of Peru

BACHELOR OF SCIENCE, ELECTRONIC ENGINEERING, HONORS LIST - 2ND PLACE IN CLASS OF 2014

- Relevant Coursework: Electronic Design I and II, Theory of Communication I and II, Computer Architecture, Electronic Project I and II, Sustainable Energy, Information Systems Workshop
- Thesis: "3D Point Cloud Registration Using a Kinect for 3D Reconstruction of Archaeological Walls" ([ES PDF](#))

Lima, Peru

2009 - 2014

## Research Interest

- Smart Buildings and Cities
- Distributed Networked Sensing
- Internet Of Things
- Machine Learning and Artificial Intelligence for the Built Environment

## Research Experience

### Department of Building - School of Design and Environment, National University of Singapore

RESEARCH ASSISTANT, BUILDING AND URBAN DATA SCIENCE LABORATORY (BUDSLAB)

- Collaborated with [SinBerBEST2](#) Post-Docs in city scale building energy analytics projects
- Guide and mentor Final Year Project students from the department
- Conducted Laboratory Sessions with Department's professors

Singapore

August. 2018 - Present

### Civil and Environmental Engineering Department, Carnegie Mellon University

RESEARCH ASSISTANT, INTELLIGENT INFRASTRUCTURE RESEARCH LAB (INFERLAB)

- Conducted a Thermal Comfort Study to predict and evaluate thermal comfort of smart buildings occupants, using a combination of different data-driven and thermal modelling methods, given environmental sensor data and bio-metrics (paper and dataset in progress for Ubicomp 2018)
- Designed, produced, and programmed an AC waveform power meter board based on an Atmega328p for the Raspberry Pi
- Collaborated in DOE funded project: Human-in-the-loop Sensing and Control for Commercial Building Energy Efficiency and Occupant Comfort
- Designed and implemented a data preparation and evaluation framework with Bosch U.S. research scientists for RGBD building occupancy data
- Implemented a BACnet agent on a Raspberry Pi to control HVAC systems on a building based on real-time occupancy data

Pittsburgh, PA

Apr. 2017 - Jun. 2018

### H. John Heinz III College, Carnegie Mellon University

GRADUATE TEACHING ASSISTANT FOR DATABASE MANAGEMENT

- Assisted in grading assignments, projects, and exams
- Designed database based on existing students' clubs for future assignments
- Suggested improvements on previous assignments and proposed alternative solutions
- Held office hours and laboratory sessions to help students with assignments and class' concepts

Pittsburgh, PA

Aug. 2016 - Dec. 2016

## Teaching Experience

### PF1108: Introduction to Building Performance, School of Design and Environment - National University of Singapore

Conducted experimental laboratory sessions to further explain class' concepts

Singapore

2019 - 1

### PF1103: Digital Construction, School of Design and Environment - National University of Singapore

Held office hours and conducted laboratory/tutorial sessions for students regarding python and data analytics for the built environment

Singapore

2019 - 1

Held office hours and laboratory sessions to help students with assignments and class' concepts. Designed new database for future homeworks

2016 - 2

## Projects

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### edX, Inc. & Coursera, Inc. (MOOC Platforms)

Completed the following online classes: Neural Networks for Machine Learning - University of Toronto (2017), Artificial Intelligence - Columbia University (2017), Machine Learning - Stanford University (2017)

Jan. 2017 - Present

### Intelligent Infrastructure Research Lab (INFERLab), Carnegie Mellon University

Designed and implemented an [open-source](#) High-Frequency AC Waveform Meter Board for the Raspberry Pi

Pittsburgh, PA

Apr. 2017 - Jul. 2017

### Scott Institute for Energy Innovation, Carnegie Mellon University

Designed and built an interactive data visualization tool for funding research data using D3, Python Flask, and MySQL database

Pittsburgh, PA

Aug. 2016

### H. John Heinz III College, Carnegie Mellon University

Elaborated a Data Mining Report on U.S. National Hospitals' spends per patient and quality benchmarking for policy improvements and recommendations

Pittsburgh, PA

Jan. 2016 - May 2016

### Laboratory of Medical Images, Pontifical Catholic University of Peru

Prototyped a height measurement analysis system for newborn babies using photogrammetry and image processing

Lima, Peru

Jan. 2015 - Feb. 2015

### Self-taught Embedded Systems Projects

Designed and built embedded system gadgets for personal use based on microcontrollers and embedded PCs

Jan. 2014 - Present

### Structural Health Monitoring Laboratory, Pontifical Catholic University of Peru

Designed and built a low-cost wireless data acquisition module for vibration, temperature, and humidity measurements

Lima, Peru

Mar. 2013 - Jul. 2013

## Publications

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- 2017 **Demo: Design and Implementation of a Low-cost Arduino-based High-Frequency AC Waveform Meter Board for the Raspberry Pi**, Matias Quintana, Henning Lange, Mario Bergés (ACM International Conference on Systems for Energy-Efficient Built Environments, BuildSys 2017) *Delft, Netherlands*
- 2017 **Demo: FORK: Fine grained Occupancy estimator using Kinect on ARM Embedded Platforms**, Sirajum Munir, Le Tran, Jonathan Francis, Charles Shelton, Ripudaman Singh Arora, Craig Hesling, Matias Quintana, Anand Krishnan Prakash, Anthony Rowe, Mario Bergés (ACM International Conference on Systems for Energy-Efficient Built Environments, BuildSys 2017) *Delft, Netherlands*
- 2015 **A Comparison of Digital Modelling Techniques Analyzing a Section of Qhapaq Ñan**, Saúl Retamozo, Diego Arce, Rafael Aguilar, Fernando Zvietcovich, Matias Quintana, Benjamín Castañeda, Sergio Ángeles (International Congress on Digital Heritage, [IEEEExplore](#)) *Granada, Spain*
- 2014 **3D Reconstruction of Archaeological Walls Using Kinect**, Matias Quintana, Fernando Zvietcovich and Benjamin Castañeda (Euromed 2014: International Conference on Cultural Heritage). Presenter and second place award winner for best poster: [Poster](#), [Award Ceremony](#), [Publication](#) *Limassol, Cyprus*
- 2014 **3D Point Cloud Registration using a Kinect for 3D Reconstruction of Archaeological Walls**, Matias Quintana (Pontifical Catholic University of Peru Digital [Thesis Repository](#)) *Lima, Peru*

## Professional Experience

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### VIT Initiative, LLC.

Pittsburgh, PA

FIRMWARE &amp; MOBILE DEVELOPER

Dec. 2017 - Jun. 2018

- Reviewed and finished company's firmware and proprietary algorithm for embedded device
- Developed data collection pipeline for Internet of Things (IoT) device, mobile devices, and web servers
- Designed and developed mobile application functionality and User Interface (UI) for IoT sensor and web server interaction
- Assembled, tested, and performed demonstration of fully finalized commercial product on clients' site and funding events

### Banking Commission

Majuro, Republic of Marshall Islands

INTERN, TECHNOLOGY CONSULTANT

May 2016 - Jul. 2016

- Assessed current state of technology infrastructure and information management, focus on potential areas for improvement
- Designed, proposed, and implemented solutions to improve the data collection and analysis process of the Financial Intelligence Division, to start their online presence, and to improve the security and reliability of their email communication
- Provided training and workshops for the office employees in the use and maintenance of the implemented systems.
- Elaborated comprehensive [final report](#) with detailed description of the project and further recommendations

## IBM

INTERN, IT STORAGE STUDENT SPECIALIST

Lima, Peru

Apr. 2014 - Jul. 2015

- Administered backend storage and SAN infrastructure for different platforms
- Initiated and maintained a storage devices inventory in the main datacenters for internal infrastructure improvement and optimization; reduced time for cabling and implementation requests by 75%
- Elaborated a new technology service based on IBM's products and CAMSS strategy, followed up by a presentation to the top management team as part of the 2015 Student Challenge
- Enforced security parameters and procedures for storage infrastructure and internal audits

## Extracurricular

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### Internet of Things Club, H. John Heinz III College, Carnegie Mellon University

Pittsburgh, PA

CO-FOUNDER AND TECHNICAL DIRECTOR

Jun. 2016 - Dec. 2016

- Gave technical training during workshops. Covered topics such as sensors, microcontrollers, light weight communications protocols, and circuit design
- Prepared projects for different laboratories and workshops sessions held by the club
- Designed and built PCBs for the club's hardware resources
- Established partnership with Dell's IoT Solutions division and invited to attend the DellEMC World 2016 conference

### Latino Graduate Student Association (LGSA), Carnegie Mellon University

Pittsburgh, PA

PRESIDENT

Dec. 2015 - Dec. 2016

- Organized social and academic events for the Latino Community on campus
- Represented the Latino Community at Minority Leadership meetings with the Provost and Associate Deans
- Raised funds and created awareness for Latino local charities and initiatives through traditional cooking events

## Skills

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**Programming Languages** Python, Java, SQL, R, C, C++, Assembly, LaTeX

**Tools/Software** EAGLE, RStudio, Matlab/Octave, Minitab

**Hardware** Atmel Microcontrollers, Raspberry Pi, Qualcomm DragonBoard

**Languages** Spanish: Mother tongue, English: Proficient, French: Basic