

# HONGSHAN GUO

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## EDUCATION

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### Princeton University

2014 - 2019

*PhD in Architecture* (Architectural Technology and Sciences)

*Master of Arts* (Architectural Technology and Sciences)

Research Area: Efficient energy delivery in achieving occupants' thermal comfort

### Columbia University

2012 - 2013

*Master of Engineering* (Mechanical Engineering)

Research Area: Energy systems engineering with an emphasis on distributed sensing technologies within the indoor environment.

### Harbin Institute of Technology

2008 - 2012

*Bachelor of Engineering* (Architectural Engineering)

Research Area: Architectural Engineering and Heat Distribution Engineering

## EXPERIENCES

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### Occupant Comfort Monitoring Sensor Development

2019 -

*Post-Doctoral Research Associate, Andlinger Center for Energy and the Environment Princeton, NJ*

- Design and fabricated real-time occupant comfort monitoring 3D prototype

### Spherical Motion Average Radiant Temperature Sensor Development

2017

*Research Associate, Industrial Institute of Research, Tokyo University*

*Tokyo, Japan*

- Prototyped a radiant surface temperature sensor with range-finding capabilities

### Campus as a Lab Sensing Project Lead

2015-2017

*Research Associate, School of Architecture, Princeton University*

*Princeton, NJ*

- Design and fabricated WiFi-enabled iAQ (air temperature, relative humidity, etc.) sensing prototypes with arduino and Particle Photons
- Built and maintained InfluxDB database for data storage & querying that hosts 30GB of data with Grafana visualisation in **Python**

### Outdoor Radiant Environment Sensing

2015 - 2017

*Research Associate, School of Architecture, Princeton University*

*Princeton, NJ*

- Designed outdoor radiant thermal comfort sensing prototype in AutoCAD
- Used statistical methods to process NOAA weather data for weather projection in **R**
- Analysed the effect of conditioning on resulting indoor relative humidity across the United States with pandas (**Python**) and GIS (esri, ArcMap)

### Geothermal energy from deep borehole heat exchangers

2016 - 2018

*Research Associate, School of Architecture, Princeton University*

*Princeton, NJ*

- Conducted term-by-term optimisation of CBHE for better heat extraction analytically in **Python**

- Used statistical methods to process NOAA weather data for weather projection in **R**
- Analysed the effect of conditioning on resulting indoor relative humidity across the United States with ESRI GIS Suite

### **Thermoheliiodome, Sensing and Construction**

2014 - 2015

*Student Researcher, School of Architecture, Princeton University*

*Princeton, NJ*

- Designed and built a plumbing system for a radiant cooling pavilion
- Programmed robotic arms to pick up styrofoam block for precision cutting in Grasshopper
- Collected and analysed data collected from radiant sensor against FLIR imagery in **Python** and Matlab

### **Post-Occupancy Evaluation Studies**

2014 - 2015

*Student Researcher, School of Architecture, Carnegie Mellon University*

*Pittsburgh, PA*

- Analysed occupant responses from excel surveys and sensing results from NEAT cart with rule-based and statistical-based NLP in **Python** and **R**

## **TECHNICAL STRENGTHS**

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<b>Programming</b>	<b>Python</b> , R, LaTeX, Arduino, Processing, JavaScript, PHP, C++, d3.js
<b>Softwares</b>	ArcGIS, G-Suite, ANSYS(FLUENT), EnergyPlus, TRNSYS, Rhino, Tableau
<b>Other Languages</b>	<b>Chinese</b> (Native), <b>Japanese</b> (Fluent), <b>Korean</b> (Intermediate)

## **HONORS & AWARDS**

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<b>Lowry Methodology Award</b>	2018
International Conference on Urban Climate	<i>New York, NY</i>
<b>Maeder Fellowship</b>	2018
Andlinger Center for Energy and the Environment	<i>Princeton, NJ</i>
<b>Princeton E-affiliates Partnership ExxonMobil Best Poster Award</b>	2017
Andlinger Center for Energy and the Environment	<i>Princeton, NJ</i>

## **SELECTED PUBLICATIONS**

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Hongshan Guo, Dorit Aviv, Mauricio Loyola, Eric Teitelbaum, Nicholas Houchois, Forrest Meggers. *On the understanding of the mean radiant temperature within both the indoor and outdoor environment, a critical review*. Renewable and Sustainable Energy Reviews, Accepted Proof, June. 2019

Hongshan Guo, Yongqiang Luo, Forrest Meggers, Marco Simonetti, *Human body exergy consumption evaluation methods evaluation and their sensitivities towards different environmental conditions*, Energy, 2019, ISSN 0360-5442 2019

Hongshan Guo, Eric Teitelbaum, Nicholas Houschois, Michael Bozlar, Forrest Meggers. *Revisiting the use of globe thermometers to estimate radiant temperature in studies of heating and ventilation*. Energy and Buildings, Vol. 180, Issue. , p. 83. 2018

Meggers, Forrest, Hongshan Guo, Eric Teitelbaum, Gideon Aschwanden, Jake Read, Nicholas Houchois, Jovan Pantelic, and Emanuele Calabr. *The Thermoheliiodome - Air Conditioning without Conditioning the Air, Using Radiant Cooling and Indirect Evaporation*. Energy and Buildings, June. 2017