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Karen Noiva

EDUCATION

MIT | Cambridge, MA

Ph.D. in Architecture:

Building Technology

2018 | GPA: 4.9/5.0

Thesis: International Comparative
Analysis of Urban Water Systems

M.S. in Architecture:

Building Technology

2011 | GPA: 4.8/5.0

Thesis: Modeling the Water Consumption
of Singapore Using System Dynamics

B.S. in Mechanical Engineering

2008 | GPA: 4.8/5.0

Concentration in Sustainability Science

COURSEWORK

GRADUATE

System Dynamics

Statistical Learning and Data Mining

Computational Science and Engineering

Time Series Analysis

Socioeconomic Impact Analysis

Infrastructure Economics

Finance

Risk and Decision Analysis

Engineering Systems Analysis

Spatial Analysis

Geographic Information Systems

Surface Hydrology

Water Resources Management

UNDERGRADUATE

Solid State Chemistry

Design and Manufacturing

Dynamics and Control

Measurement and Instrumentation

Mechanics of Materials

Product Engineering

Thermal Fluids Engineering

Desalination

Design for Development

Sustainability Science

LANGUAGES

English (native) • French • Chinese
(Mandarin) • Portuguese • Spanish

SUMMARY

Ph.D. with 8+ years of interdisciplinary research in applied methods for policy analysis, sustainability, and urban water systems. Strong analytical, technical, and communication skills. Team player who loves to bring people together to collaborate on new projects. Leadership experience in academia and industry.

EXPERIENCE

UNIVERSITY OF ARIZONA | Research Scientist

2018 – Present | Cambridge, MA

- Create system to process, clean, and analyze user data from 100+ sessions from video game for mining emergency response training.
- Perform exploratory analysis with clustering and other model-based methods.
- Identify key indicators and patterns using statistical methods.
- Develop visualizations to help practitioners interpret data and trends.
- Apply machine learning to create predictive models of performance.
- Disseminate findings through reports and industry presentations.

HARVARD UNIVERSITY | Teaching Fellow

2018 | Cambridge, MA

- Developed and presented 10 lectures and tutorials teaching business analytics and R to graduate and undergraduate students in intensive 3-week summer course.
- Held office hours and worked individually with students to support learning goals.

MIT | Ph.D. Candidate & Research Assistant

2011 – 2018 | Cambridge, MA

- Developed a new algorithmic approach and open-source tools (in R and Python) for quantitative comparison of sustainability of urban water systems.
- Identified six types of cities from 142 international cases with statistical clustering.
- Used typology to guide selection of “similar but different” cases, Singapore and Los Angeles, for comparison with ANOVA, time-series, and spatial analysis.
- Identified similar policy resistance to conservation efforts, highlighting an unexpected opportunity for policy exchange.
- Developed a new integrated urban water resources model using Vensim/Excel.
- Forecasted demand, supply, and infrastructure finance given changing population growth, economic growth, affluence, and alternative water sources.

IBM | Graduate Research Intern

2013 | Nairobi, Kenya

Initiated relationships with Kenyan water ministry and iHub, a startup incubator. Led team of 4 interns in completion of 3 projects at the Nairobi Research Lab:

- Created a Monte Carlo model of water demand and simulated future water stress in Nairobi under uncertain precipitation and population growth.
- System architecture design of a mobile app for a mobile advertising business.
- Design and implementation of a \$150 prototype weather station (1/10 the cost of commercial products) and a week-long STEM workshop for high-school students.

PROGRAMMING/SOFTWARE SKILLS

R • Python • \LaTeX • ArcGIS/GRASS GIS • HTML/CSS/Markdown • SQL • Vensim • Matlab • GAMS • Microsoft Office • Adobe Creative Cloud

SELECTED LEADERSHIP

NSF | RCN Sustainable Cities | Student Workshop Organizer

Spring 2014 | Phoenix, AZ

- Initiated and co-organized an interdisciplinary workshop for 9 graduate students from 7 institutions.

MIT | Sustainability Summit | Panel Organizer

2014 | Cambridge, MA

- Organized panel on infrastructure financing and urban resilience for hundreds of researchers and practitioners.

MIT | Urban Recycling Club, Bexley Hall | Co-Organizer and Participant

2006 – 2008 | Cambridge, MA

- Co-organizer of an informal MIT club for those interested in exploring urban waste streams.
- Collected used cooking oil from local restaurants to fuel a converted biodiesel truck.
- Harvested edible food from dumpsters at various supermarkets in Middlesex County.

MIT | 2.009: The Product Engineering Process | Team Integrator

Fall 2007 | Cambridge, MA

- Led a team of 16 mechanical engineering students in the senior capstone project.
- Developed a bicycle-powered nut grinder for small-business owners in Ghana.
- Defined project goals, coordinated tasks and deadlines, managed communication, and represented team to stakeholders.

MIT | Women's Independent Living Group | Various Positions

2004 – 2007 | Cambridge, MA

- Elected to house manager, membership coordinator, food steward, and computer chair during non-overlapping semesters.
- Various responsibilities overseeing the running and budgets of a 40-member cooperative living group.

BICYCLE TOURS

Co-Organizer and Cyclist

Spring 2009 | Sub-Saharan Africa

- Cycled 3,600 miles from Cape Town, South Africa to Dar es Salaam, Tanzania, through Botswana, Zambia, Malawi.

Summer 2007 | United States

- Cycled 3,700 miles from Portland, OR to Washington, DC, through 13 states.

SELECTED PUBLICATIONS

- Karen Marie Noiva. "International Comparative Analysis of Urban Water Systems". Ph.D. thesis. MIT, 2017.
- Karen Noiva, John E. Fernández, and James L. Wescoat. "Cluster Analysis of Urban Water Supply and Demand: Toward Large-Scale Comparative Sustainability Planning". In: *Sustainable Cities and Society* 27 (2016), pp. 484–496.
- Matthias Wörlen, Bettina Wanschura, Herbert Dreiseitl, Manfred Moldaschi, James L. Wescoat, Jr., and Karen Noiva. *Strengthening Blue-Green in Our Cities: Enhancing Blue-Green and Social Performance in High Density Urban Environments: Final Report*. Rambøll Foundation, 2016.
- Karen Noiva Welling. "Modeling the Water Consumption of Singapore Using System Dynamics". S.M. thesis. MIT, 2011.

SELECTED PRESENTATIONS

- Karen Noiva, Leonard D. Brown, and Mary Poulton. *Guidelines for Developing an Effective Safety Toolbox*. Presented at the 12th Annual New Mexico Mine Health & Safety Conference, Albuquerque, NM. June 2019.
- Karen Noiva. *Energy in the Built Environment: Sustainability 101*. Invited lecturer at the MIT Energy Initiative Lecture Series, Cambridge, MA. Nov. 2013.

SELECTED COMMUNITY SERVICE

2012 – 2014	MIT	Graduate Women's Group	Mentored undergraduate and graduate women
2011 – 2013	MIT	IDEAS Global Challenge	Mentored teams on innovation for rapidly developing markets
Spring 2008	MIT	2.007	Mentored undergraduates on engineering design for robot competition
2004 – 2007	MIT	Medlinks	First-responder and student health liaison