Max Vanatta CV

Pre-candidate for Ph.D., Environment and Sustainability | ASSET Lab, UM SEAS | +1 (719) 660 – 2957 | mvanatta@umich.edu

Education

University of Michigan, School for Environment and Sustainability, Ann Arbor, MI — Aug 2022 – Present

Doctorate, Resource Policy and Behavior

- Advised by Dr. Michael Craig
- Research centered on a) the energy transition, combining policy, technology, and equity lenses to understand the future of the power system and b) economically decarbonization of high heat industrial industries.

University of Michigan, College of Engineering, Ann Arbor, MI — Sep 2019 – Apr 2022

Master of Engineering, Energy Systems Engineering

- GPA: 4.0
- Courses of note: Energy Generation and Storage Using Modern Materials, Energy Infrastructure Systems, Advanced Energy Solutions, Power System Design & Operation

Harvard University, Graduate School of Design, Cambridge, MA — Aug 2016 - May 2018

Master of Design Studies, Concentration: Technology

- GPA: 4.0 (GSD courses not considered due to grading system; MIT cross-enrolled courses provide the values used)
- Courses of note: Human Factor Engineering (MIT), Current Research in Planetary Science (MIT), Space Systems Engineering (MIT)
- Projects of note: *Smart Marbles* NIAC Proposal, Raytracing for Radiation Simulations in OLTARIS
- Master's Thesis: Integrative Shielding, Radiation Mitigating Trans-Hab Design

Cornell University, Architecture, Art, & Planning, Ithaca, NY — Aug 2011 - May 2016

Bachelor of Architecture Professional degree (5-years)

- GPA: 3.804 / 4.0 • Credits Taken: 165 • Dean's List 5 Semesters
- Bachelor's Thesis: What is Adapted Architecture?

Honors & Awards

Degree Marshall – Architecture Class of 2016, Cornell University

- Awarded to the two highest academically achieving students of each graduating class.

Rose Mendez Undergraduate Architectural Memorial Scholarship

- Awarded to a Cornell AAP student and is "to commemorate a student who inspires others with the same excellence in qualities of the mind and of the person."

Research Interests

Equitable energy transition; energy policy; system reliability; capacity expansion modeling; energy system analysis & optimization; distributed energy resources; lifecycle analysis; low-carbon technologies; energy storage; resilience & contingency planning.

Work Experience Highlights

Graduate Student Research Assistant - ASSET Lab, UM — Sep 2021 – Dec 2021 & Sep 2022 -- Present

- Model optimal economic behavior of advanced nuclear reactor heat and electricity production for serving industrial processes as part of a Department of Energy grant.

Graduate Student Instructor- EAS 615: Renewable Energy and the Grid, UM — Jan 2022 – Apr 2022

- Assist Prof. Michael Craig in preparing course resources such as readings, problem sets, and lectures.
- Support students with their problem sets and the course materials in person and remotely using office hours, the online instruction platform, and emails.

Research Associate - ASSET Lab, UM, School for Environment and Sustainability Jan 2021 – Apr 2022

- Modeled pathways for coal power plant retirement during a just transition through a multi-criteria optimization.
- Analyzed and processed observed transportation data using Python to enable commercial partners to reduce emissions.
- Collaboratively developed an economic dispatch model to evaluate the impacts of electric vehicle charging on the Ugandan power system.
- Drafted materials for publication.

Design Education Fellow - NuVu Innovation School Jun 2018 – Feb 2021

- Communicated between partner school, Woodstock Union High School and Middle School, and NuVu Innovation School to provide the best educational opportunities to students, teachers, and community members.
- Prepared and gave lessons in wide ranging topic matters including design, analog fabrication, digital fabrication, computation, CAD, and more, to both classes of students and professional development opportunities for teachers.
- Collaborated with teachers to create design-based projects providing a means of applying content in novel and creative ways to enrich student learning across many disciplines at the school.

Technical Assistant – Harvard GSD Fab Lab Aug 2016 – Aug 2018

Research Assistant - Sabin Design Lab July 2014 – Aug 2016

- Designed, produced, and installed prototypes of various scales for interdisciplinary projects often including material science, mathematics, and biology for publications, grants, and installations.
- Collaborated with labs across the university and country including mathematics and biological engineering to provide materials for interdisciplinary publications.

Architectural/Design Intern - Epiphyte Lab May 2013 – Oct 2014

- Designed, produced, and analyzed geometrically varied concrete thermosiphon panels to evaluate how surface area and geometry would affect the heat transfer characteristics.
- Produced publication materials for Mass Regimes: Geometric Actuation of Thermal Behavior in *International Journal of Architectural Computing*.

Volunteering & Activities

Summer Math Tutor – Gigi's Playhouse, Detroit, MA May 2021 – Aug 2021

Faculty Advisor, Social Action Club – Woodstock Union MS & HS Nov 2020 – Feb 2021

Racial Justice Coalition – Woodstock Union MS & HS Sep 2020 – Feb 2021

DEI Caucus – NuVu, Boston, MA Jun 2020 – Feb 2021

Skills

Python	Microsoft Word	Grasshopper	Processing	REopt Lite
Pyomo	Adobe Creative Suite	Autodesk Fusion 360	Arduino	GREET
Microsoft Excel	Rhinoceros 5/6	AutoCAD	SAM (NREL)	Matlab

Publications

Vanatta, M., Craig, M. T., Rathod, B., Florez, J., Bromley-Dulfano, I., & Smith, D. (2022). The costs of replacing coal plant jobs with local instead of distant wind and solar jobs across the United States. *Iscience*, 25(8), 104817.

Vanatta, M., Rathod, B., Calzavara, J., Courtright, T., Sims, T., Saint-Sernin, E., Clack, H., Jagger, P. Craig, M. (2022). Emissions Impacts of Electrifying Motorcycle Taxis in Kampala, Uganda. *Transportation Research Part. D*

Hamada, S., Yancey, K. G., Pardo, Y., Gan, M., Vanatta, M., An, D., Hu, Y., Derrien, T., Ruiz, R., Liu, P., Sabin, J., Luo, D. (2019). Dynamic DNA material with emergent locomotion behavior powered by artificial metabolism. *Science Robotics*, 4(29), eaaw3512.

Vanatta, M., Moraguez, M., Miller, D. (2018). Integrative shielding: Reorganization and trade evaluation of ECLSS and propulsion systems for radiation mitigation on deep space missions. 48th International Conference on Environmental Systems.

Moraguez, M. , Vanatta, M., Miller, D. (2018). Mass-Optimal Transit Time for Acceptable Effective Radiation Dose on Manned Deep Space Exploration Missions. 48th International Conference on Environmental Systems.

Posters & Invited Presentations

(Presentation) Integrative Shielding: Organizing Resources for Improved Passive Shielding Space Radiation Blue Sky Workshop with NASA Langley Research Center and NASA Innovative Advanced Concepts

(Poster) Highly Localized Seasonal Cold-Trapping in the Neck of 2014 MU69 'Ultima Thule' 2019 Lunar and Planetary Science Conference

(Presentation) Deep Space Radiation: Sources, Effects, and Mitigation Strategies (An Architectural View) Cornell University MAE 4560: Bioastronautics and Human Performance March 13, 2018

(Poster) MIT Project Apophis: Surface Evaluation & Tomography (SET) Mission Study for the April 2029 Earth Encounter 2017 AGU Fall Meeting