

# Parth Vaishnav

7206 Raymond St., Pittsburgh, PA 15218, USA \* parthv@cmu.edu \* +1 (412) 512 2038 \* www.parthv.com

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## EDUCATION

### Carnegie Mellon University, Pittsburgh, PA

PhD in Engineering and Public Policy

May 2015

- Dissertation on reducing air pollution from international aviation and ocean shipping
- Committee: Prof. M. Granger Morgan (CMU), Prof. Paul S. Fischbeck (CMU), Prof. James J. Corbett (University of Delaware), Annie Petsonk (Environmental Defense Fund)
- Coursework in environmental law at Vermont Law School

### University of Cambridge, United Kingdom

MPhil in Technology Policy

Jul 2011

- Assessed business models to supply energy to the rural poor; commendation for outstanding performance

### National University of Singapore and Eindhoven University of Technology, Netherlands

Master of Technological Design

May 2005

### National University of Singapore

Bachelor of Engineering (Mechanical), Minor in Bioengineering

Jun 2003

## EXPERIENCE

### Carnegie Mellon University

Assistant Research Professor, Pittsburgh, PA

Sep 2017 – present

Associate Director, Center for Climate and Energy Decision-Making, Pittsburgh, PA

Nov 2015 – present

Research Engineer, Pittsburgh, PA

Nov 2015 – Sep 2017

Post-doctoral Fellow, Pittsburgh, PA

Jun 2015 – Oct 2015

### Environmental Defense Fund

Aviation Policy Intern, Washington, DC

May 2014 – Aug 2014

- Contributed to improving the International Civil Aviation Organization's (ICAO) scheme to cap carbon dioxide emissions from international aviation by estimating and publishing the impact on airlines of ICAO's proposals
- Played a key role in drafting EDF's comments in support of the U.S. Environmental Protection Agency's endangerment finding for greenhouse gases from aircraft engines [Docket ID No. EPA-HQ-OAR-2014-0828]
- Mentored a graduate recruit, who went on to provide excellent analytical support to the team and is not pursuing a doctorate in economics and law at the University of California, Berkeley

### Royal Dutch Shell

Strategy & Portfolio Analyst, The Hague, Netherlands

Apr 2008 – Sep 2010

- Triggered profitable trading decisions through analysis of long- and short-term evolution of market fundamentals for European natural gas and global liquefied natural gas (LNG)
- Provided key inputs to strategic decisions (e.g., whether to invest in gas transmission pipelines) by producing analyses and briefing materials for senior management, including the CEO of Shell

Deployment Analyst, Singapore

Oct 2006 – Mar 2008

- Managed stakeholders across functions and lines of business to improve supply chain planning processes and reduced inventory at Shell Lubricants, Singapore, by 15%

Production Planner, Singapore

Aug 2005 – Oct 2006

- Ensured >95% supply reliability to customers at an industrial lubricant oil plant operating at near-full capacity

### National University of Singapore

Research Assistant, Singapore

May 2004 – Aug 2004

- Co-founded a company to commercialize techniques to facilitate rapid exploration of product forms in the concept generation phase

### Micron Semiconductor

Undergraduate Intern, Singapore

Jan 2002 – Jun 2002

- Streamlined a packaging process and improved the facility layout to reduce floor space utilization and set-up costs by 40% each

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## JOURNAL PUBLICATIONS

Note: At Carnegie Mellon University, it is standard practice to co-author with students and for students to assume first authorship. Collaboration is strongly encouraged. "+" indicates a Ph.D. student

1. Reed, L.,+ Morgan, M.G., Vaishnav, P., Armanios, D.E., 2019. "Converting existing transmission corridors to HVDC is an overlooked option for increasing transmission capacity." *PNAS* 116, 13879–13884.  
<https://doi.org/10.1073/pnas.1905656116>
2. Bonnín Roca, J., Vaishnav, P., Laureijs, R.E., Mendonça, J., Fuchs, E.R.H., 2019. Technology cost drivers for a potential transition to decentralized manufacturing. *Additive Manufacturing* 28, 136–151.  
<https://doi.org/10.1016/j.addma.2019.04.010>
3. Abdulla, A., Vaishnav, P., Sergi, B.,+ Victor, D.G., 2019. "Limits to deployment of nuclear power for decarbonization: Insights from public opinion." *Energy Policy* 129, 1339–1346.  
<https://doi.org/10.1016/j.enpol.2019.03.039>
4. Hanus, N.L.,+ Wong-Parodi, G., Darghouth, N.R., Vaishnav, P., Azevedo, I.L., 2019. "Solar PV as a mitigation strategy for the U.S. education sector," *Environmental Research Letters* 14, 044004.  
<https://doi.org/10.1088/1748-9326/aafbcf>
5. Kaack, L.H.,+ Vaishnav, P., Morgan, M.G., Azevedo, I.L., Rai, S., 2018. Decarbonizing intraregional freight systems with a focus on modal shift. *Environmental Research Letters*, 13, 083001.  
<https://doi.org/10.1088/1748-9326/aad56c>
  - PhD student Lynn Kaack and I were interviewed by Ben Geman, a journalist at *Axios*, who published a summary of the article. The summary quotes both of us: <https://www.axios.com/newsletters/axios-generate-4f68a98a-7c7e-44be-994b-fb10fa461146.html>
  - Selected as Editor's Featured Article by *Environmental Research Letters*
6. Vaishnav, P., Horner, N., Azevedo, I.L., 2017. "Was it worthwhile? Where have the benefits of rooftop solar photovoltaic generation exceeded the cost?" *Environmental Research Letters*, 12, 094015 doi:10.1088/1748-9326/aa815e
  - Selected as Editor's Featured Article by *Environmental Research Letters* and as a "Highlight of 2017...on the basis of reviewer and Editor endorsement, significance, scientific impact, and breadth of appeal."
7. Morgan, M.G., Vaishnav, P., Dowlatabadi, H., Azevedo, I.L., 2017. "Rethinking the Social Cost of Carbon" *Issues in Science and Technology*, Summer 33(4): 43-50.
8. Bonnín Roca, J.,+ Vaishnav, P., Morgan, M.G., Mendonça, J., Fuchs, E.R.H., 2017. "When Risks Cannot Be Seen: Regulating Uncertainty in Emerging Technologies" *Research Policy* 46, no. 7 (September 2017): 1215-1233. doi: 10.1016/j.respol.2017.05.010
9. Bonnín Roca, J.,+ Vaishnav, P., Mendonça, J., Morgan, M.G., 2017. "Getting Past the Hype About 3-D Printing" *MIT Sloan Management Review* 58, 57–62 Available: <http://sloanreview.mit.edu/article/getting-past-the-hype-about-3-d-printing/>
  - Beme News, a CNN online channel, featured our research in a short video, "What happened to the 3D printing revolution?" at: <https://www.youtube.com/watch?v=f5fBwppxtkl>
10. Vaishnav, P., 2016. "Design of a Global Market Based Measure · ICAO's Market Based Mechanism: Keep It Simple." *Carbon & Climate Law Review* 10, 120–126. Available: <http://cclr.lexxion.eu/article/CCLR/2016/2/9>
11. Bonnín Roca, J.,+ Vaishnav, P., Fuchs, E.R.H., Morgan, M.G., 2016, "Policy needed for additive manufacturing." *Nature Materials* 15, 815–818. doi:10.1038/nmat4658
12. Vaishnav, P., Petsonk, A., Avila, R.A.G., Morgan, M.G., Fischbeck, P.S., 2016, "Analysis of a proposed mechanism for carbon-neutral growth in international aviation." *Transportation Research Part D: Transport and Environment, Special Issue on Climate Change and Transport* 45, 126–138. 10.1016/j.trd.2016.02.017

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13. Vaishnav, P., Fischbeck, P.S., Morgan, M.G., Corbett, J.J., 2016, "Shore Power for Vessels Calling at U.S. Ports: Benefits and Costs." *Environmental Science & Technology* 50, no. 3 (February 2, 2016): 1102–10. doi:10.1021/acs.est.5b04860.
14. Vaishnav P., 2014. "Greenhouse gas emissions from international transport." *Issues in Science and Technology*, Winter 30(2): 25-28. Available: <http://issues.org/30-2/parth/>
15. Vaishnav, P., 2013. "Costs and Benefits of Reducing Fuel Burn and Emissions from Taxiing Aircraft." *Transportation Research Record: Journal of the Transportation Research Board* 2400 (December): 65–77. doi:10.3141/2400-08.

## PUBLICATIONS UNDER REVIEW

1. Vaishnav, P., Fatimah, A.M., "The environmental consequences of electrifying space heating with current and future energy mixes," Under review at *Nature Sustainability*
2. Bonnín Roca, J. +, Vaishnav, P., Mendonça, J., Morgan, M.G., Fuchs, E., "Technology Forgiveness: The Different Institutional Resilience of Polymer and Metal Additive Manufacturing in Portugal" Under review at *Technological Forecasting and Social Change* Available: <https://papers.ssrn.com/abstract=3077276>

## WORKING PAPERS

1. "Can autonomous light vehicles be fully electric?" with Venkat Viswanathan, Aniruddh Mohan, and Shashank Sripad (all at CMU)
2. "Assessment of air emissions from ocean-going vessels at ports in India" with Priyank Lathwal and Granger Morgan (at CMU)
3. "Individual inconsistency and aggregate rationality: Overcoming inconsistencies in expert judgment at the technical frontier," with Patrick Funk, Alex Davis, Barry Dewitt, and Erica Fuchs (all at CMU)
  - Ian Wright, Managing Editor of [www.engineering.com](http://www.engineering.com) produced an eBook entitled, "Should You Use Additive Manufacturing to Produce Your Next Part?" which draws on this research and cites it. Available here: <https://www.engineering.com/ResourceMain.aspx?resid=779>

## OTHER PUBLICATIONS AND WRITINGS

1. Vaishnav, P., Morgan M., Baik, S., Larsen, P., "Estimating the Value of Enhanced Electric Power Resilience: Case Study of Idaho National Laboratory and a Planned Small Modular Reactor" Report for U.S. Department of Energy Office of Nuclear Energy under Lawrence Berkeley National Laboratory (LBNL) Contract No. DE-AC02-05CH11231
2. Azevedo, I., Horner, N., Siler-Evans, K., Vaishnav, P., 2018. [DATASET] Electricity Marginal Factors Estimates. Climate and Energy Decision Making Center, Carnegie Mellon University.
3. Vaishnav, P., 2016. "Plug the Loopholes in ICAO's Plan." *Aviation Week & Space Technology* 178, 66.
4. Vaishnav, P., Morgan, M.G., 2016. "Summary of a Workshop on Identifying and Avoiding Potential Dead Ends and Missed Opportunities in Climate Policy." Available: <http://cedmcenter.org/wp-content/uploads/2016/06/Summary-of-Workshop-on-Climate-Policy-Dead-Ends-and-Missed-Opportunities.pdf>
5. Vaishnav, P., Abdulla, A., 2016. The Myth of Technology Neutral Regulation. *The Energy Collective*. Available: <https://www.energycentral.com/c/ec/myth-technology-neutral-regulation>
  - This post was mentioned in the testimony of Dr. Edwin Lyman, Senior Scientist, Union of Concerned Scientists Global Security Program, in a hearing of the U.S. Senate Committee on Environment and Public Works on S.2795, "the Nuclear Energy Innovation and Modernization Act." The testimony is available here: [https://www.epw.senate.gov/public/?a=Files.Serve&File\\_id=49C19C65-0886-46FC-AFC7-B944CA7E2E7C](https://www.epw.senate.gov/public/?a=Files.Serve&File_id=49C19C65-0886-46FC-AFC7-B944CA7E2E7C)

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6. Bonnín Roca, J., Vaishnav, P., Fuchs, E.R.H., Morgan, M.G., 2015. "Notes on a Workshop on Certification of Metal Additive Manufacturing Systems and Parts for Use in Civil Aviation: Challenges and Opportunities." Available: [http://www.parthv.com/wp-content/uploads/2016/02/CMU\\_Workshop\\_Summary\\_FINAL.pdf](http://www.parthv.com/wp-content/uploads/2016/02/CMU_Workshop_Summary_FINAL.pdf)
7. Branstetter, L., Horner, N., Morgan, M.G., Rubin, E., Vaishnav, P., 2015. "Put Kids First, Not Gas Companies." *Pittsburgh Post-Gazette*. July 19, sec. Forum.  
Reprinted as:  
Branstetter, L., Horner, N., Morgan, M.G., Rubin, E., Vaishnav, P., "Put Kids First, Not Gas Companies." *York Dispatch*. July 27, 2015.
8. Vaishnav, P., Horner, N., Branstetter, L., 2015. "Pennsylvania Needs and Can Afford a Shale Gas Severance Tax." *Pittsburgh Post-Gazette*, January 18, sec. Forum.
9. Vaishnav, P. & Horner, N., 2014. "Apocalypse Not: Severance Taxes and Industry Exit in the Marcellus Shale." *Pennsylvania Budget and Policy Center Briefing Paper* Available: <http://tinyurl.com/n8enbtg>
  - We discussed this research extensively with State Senator Art Haywood of Pennsylvania and his staff and participated in hearings about the feasibility of a shale gas severance tax in Pennsylvania.
  - *The Allegheny Front*, a program on local environmental issues, which airs on the local National Public Radio Station (90.5 WESA), featured this work in an article and radio program available here: <http://www.alleghenyfront.org/story/pushing-new-drilling-tax-when-gas-prices-are-low>
10. Vaishnav, P., 2013. "ICAO Deal to (Eventually) Reduce Greenhouse Gas Emissions from Aviation a Good First Step." *The Energy Collective Blog Post*. Available: <https://tinyurl.com/vaishnav-icao-energycollective>
11. Vaishnav, P., 2011. "Innovation for Emerging Markets: Novel Business Models to Supply Energy to the Rural Poor." Dissertation (M.Phil.), University of Cambridge.

## CONFERENCE PRESENTATIONS WITH PEER-REVIEWED ABSTRACTS

1. Vaishnav, P. (Speaker), Fatimah, A.M., "When Should We Electrify Space Heating?", *American Geophysical Union Fall Meeting* (Washington, DC, 10-14 Dec. 2018).
2. Vaishnav, P. (Speaker), Kavakuntala, M., Fatimah, A.M., "When Should We Electrify Space Heating?", *36<sup>th</sup> United States Association for Energy Economics (USAEE) North American Conference* (Washington, DC, 24-26 Sep. 2018).
3. Kaack, L. (Speaker), Vaishnav, P., Morgan, M.G., Azevedo, I., Rai, S., "Decarbonizing intraregional freight systems with a focus on modal shift", *36<sup>th</sup> United States Association for Energy Economics (USAEE) North American Conference* (Washington, DC, 24-26 Sep. 2018).
4. Reed, L.B. (Presenter), Morgan, M.G., Vaishnav, P., Armanios, D., "[POSTER] Under What Conditions is HVDC Conversion a Cost-Effective Way to Increase Transmission Capacity in an Existing HVAC Corridor?", *36<sup>th</sup> United States Association for Energy Economics (USAEE) North American Conference* (Washington, DC, 24-26 Sep. 2018).
  - Won the award for the best poster at the Student Poster Session at the conference
5. Vaishnav, P. (Speaker), Abdulla, A., Sergi, B., Victor, D.G., "Disentangling stigma from actuarial risk: the cautionary story of nuclear power" *Society of Risk Analysis (SRA) 2017 Annual Meeting* (Arlington, VA, 10-14 Dec. 2017).
6. Vaishnav, P. (Speaker), Abdulla, A., Sergi, B., Victor, D., "Disentangling stigma from actuarial risk: the cautionary story of nuclear power" *35<sup>th</sup> United States Association for Energy Economics (USAEE) North American Conference* (Houston, TX, 12-15 Nov. 2017).
7. Vaishnav, P., Abdulla, A., "[POSTER] Public perceptions of clean energy technologies" *Society of Risk Analysis (SRA) 2016 Annual Meeting* (San Diego, CA, 11-15 Dec. 2016).
8. Bonnín Roca, J. (Speaker), Vaishnav, P. (Speaker), Fuchs, E.R.H., Morgan, M.G., "When Risks Cannot Be Seen: Regulating Uncertainty in Emerging Technologies" *RAPID + TCT* (Pittsburgh, PA, May 8-11, 2017)

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9. Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Benefit cost and distributional effects analysis for solar PV in the United States" *Society of Risk Analysis (SRA) 2016 Annual Meeting* (San Diego, CA, 11-15 Dec. 2016).
10. Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Benefit Cost and Distributional Effects Analysis for Solar PV in the United States" *INFORMS Annual Meeting* (Nashville, TN, 13-16 Nov. 2016).
11. Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Location, Location, Location: County-Level Costs and Benefits of Residential Solar Photovoltaics" *34th United States Association for Energy Economics (USAEE) North American Conference* (Tulsa, OK, 23-26 Oct. 2016).
12. Bonnín Roca, J., Vaishnav, P. (Speaker), Fuchs, E.R.H., Morgan, M.G., "How can policymakers help immature technologies cross the 'valley of death'? The case of metallic additive manufacturing for aviation" *4S Annual Meeting* (Denver, CO, 11-14 Nov.)
13. Vaishnav, P. (Speaker), "Analysis of ICAO's Market-based Mechanism: Strawman v1.1." *Technology, Management & Policy (TMP) Graduate Consortium* (Pittsburgh, PA, 21-23 Jun.)
14. Horner N. (Speaker), Vaishnav P., Tisa P. (Speaker), 2014. "Grid Access in Remote Alaska: Evaluating Costs and Benefits." *33rd United States Association for Energy Economics (USAEE) North American Conference* (New York, NY, 15-18 Jun. 2014).
15. Hoss F. (Speaker), Vaishnav P. (Speaker), 2013. "What guides spending on risk mitigation: Perceptions or statistics?" *Society of Risk Analysis (SRA) 2013 Annual Meeting* (Baltimore, MD, 9-11 Dec. 2013).
16. Horner N. (Speaker), Vaishnav P. (Speaker), 2013. "Mitigating Electric Vehicle Impacts on Grid Infrastructure Requirements." *32nd United States Association for Energy Economics (USAEE) North American Conference* (Anchorage, AK, 28-31 Aug. 2013).
17. Horner N. (Speaker), Vaishnav P. (Speaker), 2012. "Assessment of Pennsylvania Natural Gas Price Support Program Candidates." *31st United States Association for Energy Economics (USAEE) North American Conference* (Austin, TX, 5 Nov. 2012).
18. Vaishnav, P. (Speaker), 2012. "Low-hanging fruit? The costs and benefits of reducing fuel burn and emissions from taxiing aircraft." In *12th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference*. Indianapolis, IN: AIAA. Available at: <http://arc.aiaa.org/doi/abs/10.2514/6.2012-5510>.
19. Vaishnav P. (Speaker), 2011. "Innovating for Emerging Markets - The Case of Rural Electrification." *Technology Management and Policy Graduate Consortium* (University Park, PA, 26-28 Jun. 2011)

## LEADERSHIP IN WORKSHOPS AND RESEARCH MEETINGS

1. 2017: Co-organizer, with Lynn Kaack and Prof. Granger Morgan, Workshop on Strategies and Opportunities for Decarbonizing the World's Freight System, supported by the Centre for Climate and Energy Decision-Making at Carnegie Mellon University, Pittsburgh, PA
2. 2016: Co-organizer, with Prof. Granger Morgan, Workshop on Identifying and Avoiding Potential Dead Ends and Missed Opportunities in Climate Policy, supported by the Centre for Climate and Energy Decision-Making in Washington, DC

## STUDENTS ADVISED

### Current PhD students

1. Tracey Ziev, "Techno-economic analysis of additively manufactured heat exchangers", Fall 2019
2. Aniruddh Mohan (co-advised with Prof. Venkat Viswanathan of CMU Mechanical Engineering), "Technology and policy problems related to the electrification of transport," Fall 2018—present
3. Priyank Lathwal (co-advised with EPP Prof. Granger Morgan), "Benefits and costs of shore power in India," Summer 2018—present

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4. Patrick Funk (co-advised with EPP Prof. Erica Fuchs and Prof. Alex Davis), “Discovering the heuristics of additive manufacturing,” Fall 2016—present
5. Jihoon Shin (co-advised with EPP Prof. Granger Morgan, Dr. Ana Barros (University of Porto), Dr. Miguel Amaral (University of Lisbon)), “Exploring opportunities for Portugal to join the supply chain for outfitting aircraft cabin interiors (ACI),” Fall 2016—present
6. Elizabeth Reed (co-advised with EPP Prof. Granger Morgan and Prof. Daniel Armanios), “Assessing High Voltage Direct Current (HVDC) as an enabling technology for deep decarbonization of the electricity grid” Fall 2016—present

## Graduated PhD students

1. Jaime Bonnin Roca (co-advised with EPP Prof. Erica Fuchs, Prof. Granger Morgan, and Dr. Joana Mendonça (University of Lisbon)), “Leaders and followers: challenges and opportunities in the adoption of metal additive manufacturing technologies,” Fall 2017. Jaime was a postdoctoral researcher at the Institute for Manufacturing at the University of Cambridge and has begun an appointment as a tenure-track assistant professor at Eindhoven University of Technology in January 2019.

## Postdoctoral researchers

1. Thomas Deetjen (lead advisor, co-advised with Prof. Inês Azevedo and Prof. Costa Samaras) May 2019—
2. Sunhee Baik (co-advisor with Prof. Granger Morgan and Prof. Alex Davis) April 2019—June 2019

## Master’s students

1. Aradhana Gahlaut, “Climate change-related disruptions to the U.S. air system,” Fall 2018 and Spring 2019
2. Meghana Kavakuntala, “Electrification of heating in the United States – accounting for a changed climate,” Spring 2018
3. Adilla Mutia Fatimah, “Electrification of heating in the United States,” Fall 2017
4. Srijana Rai (with EPP PhD student Lynn Kaack), “Decarbonizing Global Freight Systems with a Focus on Modal Shift,” Fall 2017
5. Courtney Thier, Yichen Wei, Tania Lopez, “Updating a tool to analyze the cost and environmental impacts of user-defined electricity portfolios for Pennsylvania,” Fall 2015

## Undergraduates

1. Liam Walsh, “Assessing the Value of Flexible Electric Heating,” Summer 2019—
2. Krishna Dave, “Airline data for forecasting future airline emissions” Spring 2018
3. Olamitundun Oladipo (with EPP Prof. Alex Davis and Prof. Tamar Krishnamurti (University of Pittsburgh)), “It's what you know that just ain't so: Countering misinformation,” Fall 2017
4. Krishna Dave (with EPP PhD student Jaime Bonnin Roca), “Willingness to pay for reduced lead times in aviation supply chains,” Fall 2017
5. Cheyenne Shankle, “Identifying proposed new technologies to improve commercial aircraft fuel efficiency,” Spring 2016

## PhD THESIS COMMITTEE SERVICE

1. Yuchuan Lai (with Civil & Environmental Engineering, CMU, with Prof. David Dzombak, Prof. Jared Cohon, and Prof. Constantine Samaras), “Use of historical data to assess and forecast regional climate change,” Fall 2018—
2. Lynn Kaack (with Prof. Granger Morgan, Prof. Jay Apt, Prof. Inês Azevedo, and Prof. Patrick McSharry), “Challenges and Prospects for Data-Driven Climate Change Mitigation,” Spring 2018—Spring 2019

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3. Kerim Dickson (Civil & Environmental Engineering, CMU, with Prof. David Dzombak, Prof. Jared Cohon, and Prof. Constantine Samaras), “Interbasin Transfers in the United States: Present and Future,” Fall 2016—Fall 2018 (when Kerim graduated).

## PhD QUALIFIER COMMITTEE SERVICE

1. Woo Suk Chun (Civil & Environmental Engineering, CMU), Fall 2017
2. Tania Lopez (Civil & Environmental Engineering, CMU), Fall 2017
3. Jiaan Wang (Civil & Environmental Engineering, CMU), Fall 2017
4. Yuchuan Lai (Civil & Environmental Engineering, CMU), Fall 2017
5. Miranda Gorman (Civil & Environmental Engineering, CMU), Fall 2016

## EDUCATIONAL CONTRIBUTIONS

### Courses taught as instructor

- *Climate Change Science and Adaptation*: I designed the syllabus, instructional materials, assignments, and tests, and am the sole instructor for the course. The course consists of four parts: (1) the physical mechanisms by which climate is determined, and by which climate change occurs; (2) the projected consequences of climate change; those that are already occurring; and how societies might adapt to these changes; (3) the tools that decision-makers use to quantify and compare the damages caused by these consequences and their limitations; (4) select topics in climate change mitigation.

#### *Faculty course evaluation:*

(2018, n = 8) 4.4/5 for overall course quality and 4.6/5 for quality of teaching

(2017, n = 17) 4.5/5 for overall course quality and 4.5/5 for quality of teaching

(2016, n = 20) 4.5/5 for overall course quality and 4.6/5 for quality of teaching

### Guest lectures

- *Climate Change: Problems and Solutions* in a graduate course on Managing Emergencies and Disasters by Miriam Belblidia, interim director, Center for Disaster Management, University of Pittsburgh
- *Resilience and Asset Management* in a graduate course on Infrastructure Management by Prof. Don Coffelt and Prof. Sean Qian in Spring 2018
- *Understanding Electricity Mix Trade-offs* in a graduate course on Environmental Politics & Policy by Prof. Deborah Stine in Spring 2017 and Fall 2017
- *Climate Change: Problems and Solutions* in a graduate course on Energy Conversion and Supply by Prof. Yoosuf Picard in Fall 2016

### Service as teaching assistant at Carnegie Mellon University

- *Introduction to the Theory and Practice of Policy Analysis* (Fall 2014), taught by Prof. Granger Morgan and Prof. Inês Azevedo. Responsibilities included assessment and providing written feedback on assignments and exams, helping design exams, and holding three hour-long recitation sessions.
- *Introduction to Engineering and Public Policy* (Spring 2014), taught by Prof. Marvin Sirbu. Designed and held weekly recitation sessions for a group of 20 students to reinforce and clarify concepts taught in class, as well as weekly office hours. Assisted in the design and assessment of examinations and assignments.

### Educational outreach

- *Engineer Your World*: Instructor for CMU’s Gelfand Center’s summer outreach program for children in middle school. I provided 15 hours of classroom instruction and activities on green engineering and environmental life-cycle assessment for a class of 14 students. July 23-27, 2018. More here:  
<https://www.cmu.edu/gelfand/gelfand-outreach/summer-classes.html>



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- *Summer Centre for Climate and Energy Decision-making (SUCCEED)*: I lead a group of PhD students to organize a five-day summer workshop to teach high school students about issues relating to energy and the environment. This is followed by a two-day workshop for high school teachers covering the same topic. I teach in the workshop for teachers. More here: <https://cedmcenter.org/succeed/>

## Professional training

- *Trainer for new supply chain planning processes and tools*: In 2007, at Shell Singapore, provided 50 hours of classroom training in demand planning, production planning, and supply network planning processes and an enterprise resource planning tool to implement the new processes. Training recipients included plant operators, planners, and supply chain managers.

## GRANTS

Dates	Title	Awarding body	Role	Value
Sep 2019— Aug 2020	What new jobs might autonomous trucking create?	Block Center for Technology & Society	PI	\$75,000 (1yr of support for EPP PhD student Aniruddh Mohan)
Apr 2019— Jun 2019	Estimating the Value of Enhanced Electric Power Resilience	Berkeley Lab	Co-PI	\$96,818 (2.5 months of support for me)
Apr 2019— Apr 2021	Realizing the full value of flexible electric heating	The Alfred P. Sloan Foundation	PI, with Prof. Lucy Qui of UMD	\$300,000 (\$150k for CMU; \$150k for University of Maryland, UMD)
Jul 2019— Jun 2022	High Intensity Thermal Exchange through Materials, and Manufacturing Processes (HITEMMP)	Advanced Research Projects Agency-Energy (ARPA-E), U.S. Department of Energy	Co-PI	\$2,400,000 (we are negotiating the scope of activities; my share of the grant will be ~\$120k and will support a PhD student for one year and provide 3 months' salary support for me.)
Apr 2019— Mar 2022	Additively-Manufactured Molten Salt-to-Supercritical Carbon Dioxide Heat Exchanger	U.S. Department of Energy	Co-PI	\$2,400,000 (including \$260k in support for a PhD student I will advise and 3 months'



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Dates	Title	Awarding body	Role	Value
				salary support for me)
Sep 2018 — Aug 2019	Accelerating MAM Commercialization and Military Readiness: Expert guided machine learning to identify candidate parts and subassemblies for additive manufacturing	Manufacturing Futures Initiative, CMU	Co-PI	\$177,779
Jul 2018 — Dec 2019	To analyze the challenges and opportunities associated with upgrading and transforming high voltage transmission lines as compared with citing new transmission infrastructure	The Alfred P. Sloan Foundation	Co-PI	\$165,000
May 2018	AI for Earth Microsoft Azure Grant for PhD student Lynn Kaack	Microsoft	Faculty Advisor	\$5,000
Sep 2017— Aug 2018	Identifying Product Opportunities: Expert heuristics in scientific decision-making	Manufacturing Futures Initiative, CMU	Co-PI	\$107,091
Fall 2015	Equipment purchase grant to support experiential learning for high-school students participating in SUCCEED (SUMmer Center or Climate Energy and Environmental Decision-making)	ProSEED / Crosswalk Seed Grants, CMU	PI	\$2,500
Oct 2012— Sep 2013	Low-Hanging Fruit? The Costs and Benefits of Reducing Fuel Burn and Emissions from Taxiing Aircraft	Transportation Research Board, U.S. National Academy of Sciences	PI	\$10,000

## INVITED TALKS

- “Engineering to reduce transport greenhouse gas emissions: Autonomous electric vehicles and distributed additive manufacturing” at Department of Mechanical and Aerospace Engineering, University of California San Diego, Feb 27, 2019.
- “The Consequences of Decarbonization Strategies for Equity” at the School of Global Policy and Strategy, University of California San Diego, Feb 28, 2019.
- “Additive manufacturing: economics and challenges to adoption” delivered as a webinar to the Lawrence Livermore National Laboratory, Feb 1, 2019.
- “What can government do to support the deployment of an emerging technology?” at AED Days 2018, Oeiras, Portugal, Nov 21, 2018.
- “How might 3D printing change manufacturing practice and supply chains?” at the Institute for Manufacturing, University of Cambridge, Mar 15, 2018.
- “Is the sky the limit: can we decarbonize civil aviation?” at the Deep Decarbonization Initiative (D2I), Laboratory on International Law & Regulation (ILAR), University of California San Diego, Nov 29, 2017.

## AWARDS

- 2013: Third prize (team) at the US Association of Energy Economics’ (USAEE) Case Competition at the USAEE’s 32nd North American Conference, Anchorage, AK
- 2012: Second prize (team) at USAEE’s Case Competition at the 31st North American Conference, Austin, TX

# Parth Vaishnav

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- 2011: Letter of commendation for outstanding performance in the MPhil by the University of Cambridge
- 2011: Hughes Hall Scholarship covering tuition fees associated with pursuing a PhD at the University of Cambridge. Each year, only one student at Hughes Hall is offered this award.
- 2009: Vice President's award from Shell Energy Europe (SEE) for work on modeling the impact of the 2009 recession in Europe on natural gas demand. The awards were presented to up to three people each quarter, from SEE's staff of about 500.
- 2008: Vice President's award from SEE for work on the identification of potential bottlenecks in Europe's gas transmission pipeline system
- 1999: SIA-NOL Scholarship, covering all expenses for undergraduate studies at the National University of Singapore, by the Government of Singapore. About 1% of applicants were successful
- 1997: National Talent Search Scholarship by the Government of India. Less than 1% of applicants were successful

## PROFESSIONAL ACTIVITIES

- Chair, USAEE Case Competition. Leading a team to write the case, liaise with sponsors, publicize the competition to ensure wide participation, and to organize judging of entries. The cases are available here: <http://www.parthv.com/usaee-cases/> (2016 onwards)
- Committee service at the Department of Engineering & Public Policy, Carnegie Mellon University
  - 2018—Graduate curriculum committee
  - 2018—Part B qualifier committee
  - 2018—Energy and environment area co-chair (with Prof. Haibo Zhai)
  - 2018—Committee on culture and well-being
- Ad-hoc reviewer for *Environmental Research Letters*, *Transportation Research Part C: Emerging Technologies*, *Transportation Research Part D: Transport and Environment* and *Energy Journal, Sustainability*
- Peer reviewer for a study commissioned by the Asian Development Bank (ADB) on Technological Transformation in Indonesia
- Conference abstract reviewer for US Association of Energy Economics Annual Meeting (2017, 2018)
- Co-wrote, with Prof. Eric Hittinger of the Rochester Institute of Technology, the problem for the US Association of Energy Economists (USAEE) Case Competition (2015)

## PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science (AAAS), United States Association of Energy Economics (USAEE), American Geophysical Union (AGU)

## LANGUAGES

- English — native proficiency
- German — intermediate proficiency
- Hindi — intermediate proficiency
- Gujarati — intermediate proficiency
- Marathi — basic proficiency

## PERSONAL INFORMATION

Date of birth: June 11, 1981; Sex: Male; Citizenship: India, US Lawful Permanent Resident (Green Card)

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