

CONTACT INFORMATION	Link Lab SE-29, Olsson Hall, SIE Dept. University of Virginia Charlottesville, VA 22904 Tel: +1 (484) 995-8218	Homepage: http://www.harsh-anand.live Linkedin: www.linkedin.com/in/harshanand007 ✉ E-mail: yyf8rj@virginia.edu
EDUCATION	University of Virginia , Virginia, USA <ul style="list-style-type: none">• Doctor of Philosophy in Systems Engineering, GPA: 4/4 May'2021 – (Expected) May'2024 (<i>Data Science and Operations Research concentration</i>)• Topic: <i>Data-driven Strategies for Enhanced Community Resilience Against Hurricanes</i>• Committee: Negin Alemazkoor (Co-Advisor), Majid Shafiee-Jood (Co-Advisor), James H. Lambert (Chair), Samarth Swarup, Mani Rouhi Rad The Pennsylvania State University , Pennsylvania, USA <ul style="list-style-type: none">• Master of Science in Data Science and Analytics, GPA: 4/4 2019 – 2021• Thesis: <i>Energy Infrastructure Resilience and Economic Impacts: Modeling, Data Analytics, and Metrics</i>• Committee: Mohamad Darayi (Advisor), Colin J. Neill (Chair), Raghvinder S. Sangwan, Satish M. Srinivasan, and Ashkan Negahban Manipal University , Karnataka, India <ul style="list-style-type: none">• Bachelor of Technology in Information Technology, GPA: 3.67/4 2011 – 2015 (<i>Computer Science concentration</i>)	
RESEARCH INTEREST	<ul style="list-style-type: none">• Methodological domains: machine learning, deep learning, reinforcement learning, system modeling and simulation, data-driven decision making, mathematical modeling and optimization• Application domains: energy systems, interdependent infrastructure systems, healthcare, computational sustainability, freight transportation, climate change	
RESEARCH EXPERIENCE	Doctoral Researcher - University of Virginia , VA, USA May'2021 – Present Graduate Researcher - The Pennsylvania State University , PA, USA Nov'2019 – May'2021 Research Assistant – Dept. of Information Technology, MIT, Manipal , India 2013 – 2015 Research Intern – Indian Institute of Technology (IIT), Guwahati , India Summer 2013	
PROFESSIONAL EXPERIENCE	Data Science Intern - Swiss Re , New York, NY, USA Jun'2020 – Aug'2020 Senior Data Scientist - Kearney , Mumbai, India Jan'2017 – May'2021 Machine Learning Engineer - A.I. Research Lab, TCS , Kochi, India Aug'2015 – Nov'2016 Data Science Intern, Semantic Search - DataWeave Inc. , Bangalore, India Jan'2015 – Jun'2015	
TEACHING EXPERIENCE	Co-instructor - School of Data Science (DS 4002: Data Science Projects) Ongoing Co-instructor and TA - School of Data Science (DS 4002: Data Science Projects) Fall 2023 Teaching Assistant - School of Data Science (DS 6030: Statistical Learning) Spring 2023 Teaching Assistant - School of Data Science (DS 4002: Data Science Projects) Fall 2022 Teaching Assistant - School of Data Science (DS 6030: Statistical Learning) Summer 2022 Teaching Assistant - School of Data Science (DS 6030: Statistical Learning) Spring 2022 Academic Assistant and Tutor - Manipal University (Data Structures and Algorithms) Spring 2014	

TECHNICAL
SKILLS

- *Advanced Data Science*: Machine Learning, Deep Learning, Reinforcement Learning, Uncertainty Quantification, Meta-Learning, Transfer Learning
- *Data Analytics*: Data Mining, Predictive and Prescriptive Modeling, Quantitative Analysis, Parametric & Non-Parametric Statistical Modeling, Causal and Bayesian methods, Time-series forecasting, Design of Experiments, A/B Testing, ANOVA, Bootstrapping, Data Structures and Algorithms
- *Programming Languages*: Python, R, SQL, Java
- *Development*: TensorFlow, PyTorch, Spark (PySpark, Spark SQL), Hadoop, MapReduce, Graph DB, HBase, Neo4j, CI/CD Jenkins
- *Project Management*: Project Planning, Agile Development, Leadership, Problem Solving
- *Visualization/Others*: Power BI, Tableau, Elastic Search, Excel (Advanced), AIIMS, Minitab, KNIME, Alteryx, AWS, IBM Bluemix, Palantir Foundry

PEER-
REVIEWED
PUBLICATIONS

9. Ma, Xiaoyuan, Pierce, Eric, **Anand, Harsh**, Aviles, Natalie, Kunk, Paul and Alemazkoo, Negin (2023), "Early Prediction of Response to Palliative Chemotherapy in Patients with Stage-IV Gastric and Esophageal Cancer," *BMC Cancer* 23, 910
8. **Anand, Harsh**, Nateghi, Roshanak and Alemazkoo, Negin (2023), "Bottom-up Forecasting: Applications and Limitations in Load Forecasting using Smart Meter Data," *Data-Centric Engineering*, 4, e14
7. **Anand, Harsh**, Shafiee-Jood, Majid, and Alemazkoo, Negin (2023). "Perspicuity of Evacuation Behavior in Communities During Hurricanes Using Large-Scale Mobility Patterns and Communal Characteristics," *2023 57th Annual Conference on Information Sciences and Systems (CISS)*, Baltimore, MD, USA, 2023, pp. 1-6
6. Sharma, Rahul*, **Anand, Harsh***, Badr, Youakim and Qiu, Robin (2021). "Time-to-Event Prediction using Survival Analysis for Alzheimer's Disease Progression," *Alzheimer's & Dementia: Translational Research & Clinical Interventions*, 7:e12229 (*Equal contribution)
5. **Anand, Harsh** and Darayi, Mohamad (2021). "A Probabilistic Approach to Modeling Power Network Component Importance Considering Economic Impacts," *Proceedings of the 2021 IISE Annual Conference*, 1010-1015
4. **Anand, Harsh** and Darayi, Mohamad (2021). "Power Network Component Vulnerability Analysis: A Machine Learning Approach," *Procedia Computer Science*, 185, 73-80
3. Jaiswal, Devendra, **Anand, Harsh**, Srinivasan, Satish and Darayi, Mohamad (2021). "A Data-Driven Model to Generate Disruptive Scenarios for Infrastructure Resilience Studies," *Procedia Computer Science*, 185, 248-255
2. Saxena, Akshay, **Anand, Harsh**, Pradhan, Tribikram and Mishra, S. R. (2015). "A Hybrid Chaining Model with AVL and Binary Search Tree to Enhance Search Speed in Hashing." *International Journal of Hybrid Information Technology*, 8(3), 185-194
1. Pradhan, Tribikram, **Anand, Harsh** and Goyal, Akul (2014). "THA - A Hybrid Approach for Rule Induction System using Rough Set Theory, Genetic Algorithm and Boolean Algebra." *Global Journal of Researches in Engineering: Numerical Methods*, 14(1), 11

UNDER
REVIEW

4. **Anand, Harsh**, Alemazkoo, Negin, and Shafiee-Jood, Majid, "*HEvOA*: A comprehensive database of hurricane evacuation orders in the United States from 2016 to 2022," submitted to *Nature Scientific Data*
3. **Anand, Harsh**, Shafiee-Jood, Majid, Rouhi Rad, Mani, and Alemazkoo, Negin, "Evaluating the Effectiveness of Hurricane Evacuation Orders by Leveraging Large-scale Human Mobility Patterns," submitted to *Nature Scientific Report*
2. Gollapalli, Madhuri, **Anand, Harsh**, Srinivasan, Satish M., "Characterizing Diseases using Genetic and Clinical Variables: A Data Analytics Approach," presented at *International Conference on Intelligent Biology and Medicine* and accepted for publication at *Quantitative Biology*
1. **Anand, Harsh** and Darayi, Mohamad, "Modeling and Analyzing Energy Infrastructure Resilience considering Economic Impact," submitted to *Energies*

8. Hasnat, Md Abul, **Anand, Harsh**, Tootkaboni, Mazdak, Alemazkoor, Negin, "Spatio-temporal Graph Neural Network-based Detection of FDIA and Energy Theft from Smart Meter Power Consumption Data at Geographical Hierarchical Levels," draft in preparation for submission to *IEEE Transactions in Power Systems*
7. **Anand, Harsh**, Alemazkoor, Negin, and Shafiee-Jood, Majid, "Evaluating Income and Race Disparities across multiple Atlantic Hurricanes," analysis and draft in preparation for submission to *Natural Hazards Review*
6. **Anand, Harsh**, Watson, Walker, and Alemazkoor, Negin, "Evaluating Energy Utilization Patterns for Policy Development Towards Equity," analysis and draft in preparation for submission to *Natures Scientific Report*
5. **Anand, Harsh**, Khayambashi, Kamiar, Taghizadeh, Mehdi, and Alemazkoor, Negin, "Leveraging Spatio-temporal Predictive Models for Optimal Data Transmission and Storage Reduction in Wireless Sensor Networks," draft in preparation for submission to *IEEE Internet of Things Journal*
4. **Anand, Harsh** and Darayi, Mohamad, "Infrastructure Systems Resilience using Machine Learning Techniques: A Literature Review," draft in preparation for submission to *Sustainability*
3. Mohellebi, Elias, **Anand, Harsh**, Darayi, Mohamad, Negahban, Ashkan, "Developing and Evaluating an Integrated Mobility and Epidemic Vulnerability Index via Network Analysis," draft in preparation for submission to *PLOS One*
2. **Anand, Harsh**, "Multi-Fidelity Deep Q-Learning with Action Probing," experiments and draft in preparation
1. **Anand, Harsh**, Alemazkoor, Negin, and Shafiee-Jood, Majid, "Evaluating Evacuation Effectiveness and Community Behavior in Successive Similar Trajectory Hurricanes via Mobility Data," analysis and draft in preparation for submission to *Natures Scientific Report*

1. **Anand, Harsh**, and Alemazkoor, Negin, "Long-term impact of climate change on power grids." In *Advancing the Resilience of the Power Grid under a Changing Climate*, chapter draft in preparation for book publishing under IEEE and Wiley

7. **Anand, Harsh**, Shafiee-Jood, Majid, and Alemazkoor, Negin, "Evaluating the Effectiveness of Hurricane Evacuation Orders by Leveraging Large-Scale Human Mobility Patterns," Technical Presentation in the session *Response and Recovery to Disasters and Disruptions*, INFORMS 2023 Annual Meeting, Phoenix, October 2023
6. **Anand, Harsh**, Shafiee-Jood, Majid, and Alemazkoor, Negin, "Perspicuity of Evacuation Behavior in Communities During Hurricanes Using Large-Scale Mobility Patterns and Communal Characteristics," Technical Presentation in the session *Applied Machine Learning*, 2023 57th Annual Conference on Information Sciences and Systems (CISS), Baltimore, March 2023
5. **Anand, Harsh**, Shafiee-Jood, Majid, Rouhi Rad, Mani, and Alemazkoor, Negin, "Evacuation Order Effectiveness And Community Behavior: Enabling Strategic Data-driven Decision Making Through Big Data," Technical Presentation in the session *Machine Learning Applications and Data-centric AI*, INFORMS 2022 Annual Meeting, Indianapolis, October 2022
4. **Anand, Harsh**, Shafiee-Jood, Majid and Alemazkoor, Negin, "Enabling Causal Study of Evacuation Orders Effectiveness through Big Data," Presentation in the *2022 Environmental Futures Forum*, Energy Resilience Institute, Charlottesville, October 2022
3. **Anand, Harsh** and Darayi, Mohamad, "A Review On Energy Infrastructure Resilience: Modeling, Metrics And Data Analytics," Technical Presentation in the session *Energy Infrastructure Resilience and Economic Impacts*, INFORMS 2021 Annual Meeting, October 2021
2. **Anand, Harsh** and Darayi, Mohamad, "A Probabilistic Approach to Modeling Power Network Component Importance Considering Economic Impacts," Technical Presentation in the session *Data and System Analytics Application II*, IISE 2021 Annual Meeting, May 2021
1. **Anand, Harsh** and Darayi, Mohamad, "Modeling and Analyzing Energy Infrastructure Resilience considering Economic Impact," Technical Presentation in the session *Equilibrium Modeling of the Environmental and Institutional Aspects of Interregional Electricity Trade*, INFORMS 2020 Annual Meeting, November 2020

POSTER PRESENTATIONS

6. **Anand, Harsh**, Shafiee-Jood, Majid, and Alemazkoor, Negin (2023). “Evacuation Order Effectiveness and Community Behavior: Enabling Strategic Data-Driven Decision Making through Big Data,” U.S. Environmental Protection Agency International Decontamination Research and Development Conference, Charleston, December 2023 (*Best Poster Winner Award*)
5. **Anand, Harsh** and Alemazkoor, Negin (2022). “Enabling Causal Study of Evacuation Orders Effectiveness through Big Data,” Link Lab - UVA Engineering Poster and Flash Talk, Charlottesville, February 2022
4. **Anand, Harsh** and Darayi, Mohamad (2021). “Modeling and Analyzing Energy Infrastructure Resilience considering Economic Impact,” IISE QCRE/DAIS Best Student Poster Session
3. **Anand, Harsh**, Sharma, Rahul and Mungee, Atharva (2020). “Projecting Patterns with Causal Influences in a Dynamic Ecosystem for Retail Sales Forecasting,” Penn State Poster Competition, Malvern, PA (*Runners Up Award*)
2. Mani, Alakesh, **Anand, Harsh** and Venkat, Akula (2020). “A Qualitative Study of Multi-Channel Marketing Campaigns using Market Mix Modeling,” Penn State Poster Competition, Malvern, PA
1. **Anand, Harsh** (2020). “Modeling and Analyzing Energy Infrastructure Resilience considering Economic Impact,” Penn State Poster Competition, Malvern, PA

AWARDS AND FELLOWSHIPS

Nominee (top 5% among 800+ TAs across UVA) for Graduate Teaching Award	2023, 2024
Olsen Graduate Fellowship (<i>Endowed Fellowship</i>)	2023
Louis T. Rader Outstanding Graduate Service Award	2023
Pete Cone Memorial Scholarship	2023
International Student Citizen Leaders Fellowship	2022 – 2023
Link Lab Flash Talk Award	2022
INFORMS ORMS Tomorrow Conference and Travel Award	2021, 2022
Outstanding Student Award in Data Analytics, Penn State University	2021
Penn State Valedictorian, Class of 2021	2021
The Web Conference 2021 Student Scholarship	2021
Warren V. Musser Fellowship in Entrepreneurial Studies	2020 – 2021
Penn State Chancellor’s Scholarship (<i>Merit Award</i>)	2019 – 2020
AICTE Scholarship (<i>Tuition Waiver</i>), Manipal University	2011 – 2015

COMPETITIONS

Winner – Best Poster Award Competition @ 2023 U.S. EPA Decon Conference	2023
Winner – Freestyle O.R. Supreme Case Competition @ 2022 INFORMS	2022
Finalist – Duke-UNC-TMC Consulting Case Competition	2022
Winner – Freestyle O.R. Supreme Case Competition @ 2021 INFORMS	2021
Finalist – Mentor and Participant - 2021 Nittany AI Challenge	2021
Third Place – Innovation Design Competition @ 2021 IISE	2021
Best Student Pitch - Lion Cage : Annual competition for early-stage entrepreneurs	2021, 2020
Winner – Freestyle O.R. Supreme Case Competition @ 2020 INFORMS	2020
Judge and moderator - Smart India Hackathon - Sentiment Analysis of Code-Mixed Languages	2020
Placed in top 10% for prototyping Video-To-Text Summarizer - 2020 Nittany AI Challenge	2020
Runner’s Up - Penn State Poster Competition - Retail Sales Forecasting	2020
Winner of Wawa - HCL Hackathon: Sales forecasting for Wawa using LSTM and Prophet	2019
Ranked top 1% in 4th International Math Olympiad and 13th National Science Olympiad	

LEADERSHIP	Chair - Graduate Engineering Student Council, University of Virginia	2023 – Present
	Chair - Systems Engineering Student Advocacy Committee, University of Virginia	2023 – Present
	Treasurer and Livability Chair - Link Lab, University of Virginia	2023 – Present
	Selection Chair - Engineering School, Raven Society	2023 – Present
	Senior Advisor - Graduate Consulting Club, University of Virginia	2023 – Present
	VP of Projects - Graduate Consulting Club, University of Virginia	2021 – 2023
	Chair (Interim) - Graduate Engineering Student Council, University of Virginia	2022 – May 2023
	Vice-Chair - Graduate Engineering Student Council, University of Virginia	2022 – 2022
	Livability Liaison - Link Lab, University of Virginia	2022 – 2023
	International Student Chair (ESE Graduate Student Council), University of Virginia	2021 – 2023
	Student Senator, School of Graduate Professional Studies, Penn State University	2019 – 2021
	Global Programs Senate Committee, Penn State University	2020 – 2021
	Student Council and Curriculum Change Committee, Manipal University	2012 – 2015
	Class Representative, Manipal University	2012 – 2015
	Educator for Non-profit, Chala Janjatiya Vikas Sanstha	2009 – 2019
PROFESSIONAL SERVICES	Program Committee Member and Reviewer - Manuscript and Posters, US-RSE Conference	2023
	Professional Studies Advocacy (through promo videos) for US Dept. of State, EducationUSA	2023
	Editorial Board Member - OR/MS Tomorrow, INFORMS	2023 – Present
	Writer, eNews Daily and OR/MS Today Coverage - INFORMS 2022 Annual Meeting	2022
	Webmaster - OR/MS Tomorrow, INFORMS	2021 – 2022
	Facilitator, Energy & Infrastructure - INFORMS 2021 Annual Meeting	2021
	Reviewer	
	<i>International Journal of Medical Informatics</i>	
	<i>Transportation Research Board (TRB)</i>	
	<i>Digital Transformation and Society</i>	
	<i>US Research Software Engineer Association</i>	
	<i>IEEE Intelligent Transportation Systems Society</i>	
	Session Chair	
	<i>2023 INFORMS Annual Conference</i>	2023
	TA16. Response and Recovery to Disasters and Disruptions	
	<i>2021 Complex Adaptive Systems Conference</i>	2021
	Session 4: System Analysis	
	Session 7: Applications of AI	
	Session 11: Data Science and Analytics	
OTHER SERVICES	Core Member - Student Health Advisory Committee, University of Virginia	2023 – Present
	Waste Action Planning Committee, University of Virginia	2023
	Honor and Academic Integrity Committee, University of Virginia	2022
	Faculty Search Committee, ESE Dept., University of Virginia	2022
	K-12 Outreach - Starr Hill Pathways Program , UVA Equity Center	Summer 2022
AFFILIATIONS	Transportation Research Board (TRB)	
	Institute for Operations Research and the Management Sciences (INFORMS)	
	Institute of Industrial and Systems Engineers (IISE)	
	The Honor Society of Phi Kappa Phi	
	Complex Adaptive Systems Conference	
	The Raven Society - The oldest and most prestigious honorary society at UVA	

REFERENCES

Dr. Negin Alemazkoor

Assistant Professor, Civil and Systems Engineering
The University of Virginia
E-mail: na7fp@virginia.edu

Dr. Majid Shafiee-Jood

Research Assistant Professor, Civil and Systems Engineering
The University of Virginia
E-mail: ms2dm@virginia.edu

Dr. Mohamad Darayi

Assistant Professor, Systems Engineering
The Pennsylvania State University
E-mail: mud415@psu.edu

Industry references are available upon request.