HARI PRASANNA DAS

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RESEARCH INTERESTS

Deep Learning | Generative Modeling | Computer Vision | IoT | Smart and Energy Efficient Buildings | Climate Change

EDUCATION

PhD, Electrical Engineering and Computer Sciences — *August 2017- present*
University of California, Berkeley
Advisor: Prof. Costas J. Spanos

B.Tech (Honors), Electrical Engineering — *July 2012- May 2016*
Indian Institute of Technology (IIT), Kharagpur
Advisor: Prof. Ashok Kumar Pradhan

HONORS AND AWARDS

- National Science Foundation (NSF) Award to attend Doctoral Consortium on Computational Sustainability — *October 2019*
- Young Scientist Award, invitation to attend Global Young Scientists Summit (GYSS) 2019, Singapore — *January 2019*
- Singapore Berkeley Building Efficiency and Sustainability in the Tropics (SinBerBEST) Graduate Fellowship, National Research Foundation (NRF), Singapore — *May 2018- Present*
- Department of Electrical Engineering and Computer Sciences Fellowship, UC Berkeley — *August 2017-April 2018*
- Undergraduate Merit-cum-means Scholarship, IIT Kharagpur — *July 2012- April 2016*
- Outstanding Performance Award, Ministry of Science and Technology, Government of India (Awarded to top 1% students all over India in Higher Secondary Examination) — *May 2012*

RESEARCH PUBLICATIONS

- "Likelihood Contribution based Multi-scale Architecture for Generative Flows", **Hari Prasanna Das**, Pieter Abbeel and Costas J. Spanos, *arXiv preprint:1908.01686v2, 2019*
- "Design, Benchmarking and Explainability Analysis of a Game-Theoretic Framework towards Energy Efficiency in Smart Infrastructure", **Hari Prasanna Das**, Ioannis C. Konstantakopoulos, Aummul Baneen Manasawala, Tanya Veeravalli, Huihan Liu and Costas J. Spanos, *Workshop on Tackling Climate Change with Machine Learning, **NeurIPS** 2019*
- "Machine Learning empowered Occupancy Sensing for Smart Buildings", Han Zou, **Hari Prasanna Das**, Jianfei Yang, Yuxun Zhou and Costas J. Spanos, *Climate Change + AI Workshop, International Conference on Machine Learning **(ICML)** 2019*
- "WiFi and Vision Multimodal Learning for Accurate and Robust Device-Free Human Activity Recognition", Han Zou, Jianfei Yang, **Hari Prasanna Das,** Huihan Liu, Yuxun Zhou and Costas J. Spanos, *Multimodal Learning and Applications (MULA) Workshop, Conference on Computer Vision and Pattern Recognition **(CVPR)** 2019*
- "Consensus Adversarial Domain Adaptation", Han Zou, Yuxun Zhou, Jianfei Yang, Huihan Liu, **Hari Prasanna Das** and Costas J. Spanos, *Proceedings of the **AAAI** Conference on Artificial Intelligence 2019*
- "A Novel Graphical Lasso based approach towards Segmentation Analysis in Energy Game-Theoretic Frameworks", **Hari Prasanna Das**, Ioannis C. Konstantakopoulos, Aummul Baneen Manasawala, Tanya Veeravalli, Huihan Liu and Costas J. Spanos, *Proceedings of the Special Session on Machine Learning in Energy Application, **ICMLA** 2019*
- "Personal thermal comfort models with wearable sensors", Shichao Liu, Stefano Schiavon, **Hari Prasanna Das**, Ming Jin and Costas J. Spanos, *Building and Environment, 162:106281, 2019*
- "BISCUIT: Building Intelligent System Customer Investment Tools", Ming Jin, Ruoxi Jia, **Hari Prasanna Das**, Wei Feng and Costas Spanos, *In Proc. 10th International Conference on Applied Energy **(ICAE)**, 2018*

RELEVANT COURSEWORKS

Deep Unsupervised Learning

High Dimensional Statistics (Tail bounds, concentration inequalities, complexities)

Convex Optimization and Algorithms

Linear and Non-linear Systems

HIGHLIGHTED RESEARCH PROJECTS

Likelihood Contribution based Multi-scale Architecture for Generative Flows

- Improved the multi-scale architecture of flow models via data-dependent splitting, unlike static splitting methods in prior works.
- Proposed architecture achieved enhanced density estimation and qualitative sampling.
- Performed ablation studies to confirm novelty of the proposed heuristic as compared to other options.

Transfer Learning and Sensor Fusion for Human Activity Recognition (AAAI 2019, MULA-CVPR 2019,CCAI-ICML 2019)

- Proposed a noble unsupervised and few-shot adversarial domain adaptation framework using Generative Adversarial Networks (GANs) achieving state of the art result in transfer learning task on standard image benchmarks.
- Conducted experiments to obtain wifi signals under human interference and constructed a deep learning framework for human activity recognition in Smart Buildings.
- Performed sensor fusion using wifi and vision modalities to make the human activity recognition model more robust and accurate.

Design, Benchmarking and Segmentation Analysis of an Energy Game-Theoretic Framework (NeurIPS 2019, ICMLA 2019)

- Leveraged IoT sensors to collect energy usage data from an energy social game hosted at NTU, Singapore.
- Employed a Graphical lasso model to obtain key characteristic feature correlations useful for segmentation of occupants as per their energy usage behavior and utility learning.
- Predicted underlying characteristics of different classes as per energy usage behaviors and learned causal interactions between features, helpful in intelligent incentive design and ultimate building energy efficiency.

RELEVANT SKILLS

Programming Languages: Python, C, C++, Matlab, R
AI Frameworks: PyTorch, TensorFlow, Keras, Scikit-Learn, Numpy, Matplotlib, Pandas

TEACHING

EECS 127/227 AT: Optimization Models in Engineering, Fall 2019, UC Berkeley with Prof. Alexandre M. Bayen

LEADERSHIP AND COMMUNITY SERVICE

Technical Program Committee (TPC) Member, Workshop on **"Tackling Climate Change with Machine Learning"** *August 2019*
as part of Neural Information Processing Systems **(NeurIPS)** 2019

Organizer, **International Workshop on Applied Machine Learning for Intelligent Energy Systems (AMLIES)** *June 2019*
Co-located with **ACM e-Energy Conference**, 2019, Phoenix, Arizona, U.S.A

- Responsible for design, review of papers, publicity and overall coordination of the workshop.

Technical Program Committee (TPC) Member, Workshop on **"AI for Energy-Cyber-Physical Systems"** *April 2018*
as part of International Conference on Applied Energy **(ICAE)**, 2018

Student Reviewer, Graduate Admissions Committee, Department of EECS, UC Berkeley *December 2018*

Faculty Interview Coordinator, Department of EECS, UC Berkeley *September 2017-April 2018*

Project Leader, Topics in Current Scientific Research, SMASH *June 2018-Present*

(Summer Math and Science Honors Academy (SMASH) is a college-prep program serving local high school students from traditionally marginalized group in STEM)

- Mentored four high school freshers in a science project on building a Smart Smoke Detector using Arduino.
- Taught them different skills such as coding, app development, hardware design and presentation techniques.

Vice President, Dakshana Alumni Network (DAAN) *September 2015-August 2016*

(Dakshana Alumni Network is the official alumni body of the Non- Governmental Organisation (NGO), Dakshana, which provides free coaching for competitive engineering and medical entrance exams to promising scholars)

- Supervised the efficient functioning and performance of 3 Teams with 3 Team Heads and 7 Secretaries.
- Instrumental in process planning and flawless organization of the Dakshana Selection Test.

REFERENCE

Prof. Costas J. Spanos, Andrew S. Grove Distinguished Professor, Department of EECS, UC Berkeley
Director, CITRIS and the Banatao Institute | Interim Director and CEO, Berkeley Education Alliance for Research in Singapore
spanos@berkeley.edu | spanos@citris-uc.org