Ayan Mukhopadhyay

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Research

Probabilistic modeling, decision-making under uncertainty, multi-agent systems and robust machine learning applied to social good.

Experience

1. Stanford University, USA (October 2019-)
a) Post-Doctoral Research Fellow
Stanford Intelligent Systems Lab
Advisor: Prof. Mykel Kochenderfer
Received "Center of Automotive Research Post-Doctoral Fellowship"

b) Technical Mentor, Stanford CS for Social Good Impact Lab, 2020

Education

Vanderbilt University, USA (2014-2019)
Ph.D. (Computer Science)
Advisor: Prof. Yevgeniy Vorobeychik
Thesis: "Robust Incident Prediction, Resource Allocation and Dynamic Dispatch"
Nominated for "Victor Lesser Distinguished Dissertation Award 2020"
(GPA : 3.98/4)

West Bengal University of Technology, India (2007-2011)
B.Tech, Computer Science, 2011.
(GPA : 8.91/10)

Publications

Pre-prints

1. Mukhopadhyay, Ayan, et al., "A Review of Emergency Incident Prediction, Resource Allocation and Dispatch Models", *arXiv pre-print*.

Peer-reviewed Conferences

1. Mukhopadhyay, Ayan, et al., "Robust Spatio-Temporal Incident Prediction", *Proceedings of the 36th Conference on Uncertainty in Artificial Intelligence (UAI 2020) (to appear)*.

2. Pettet, Geoffrey, et al., "On Algorithmic Decision Procedures in Emergency Response Systems in Smart and Connected Communities", *Proceedings of the 19th Conference on Autonomous Agents and MultiAgent Systems (AAMAS 2020)*.

3. Mukhopadhyay, Ayan, et al., "An Online Decision-Theoretic Framework for Responder Dispatch", *Proceedings of the 10th ACM/IEEE Conference on Cyber-Physical Systems (ICCPS 2019)*.

4. Mukhopadhyay, Ayan, et al.,"A Decision Theoretic Framework for Emergency Responder Dispatch", *Proceedings of the 17th Conference on Autonomous Agents and MultiAgent Systems. (AAMAS 2018)*.

5. Mukhopadhyay, Ayan, et al., "Incident Prediction and Response Optimization", *Proceedings of the 17th Conference on Autonomous Agents and MultiAgent Systems. (AAMAS 2018)* (Doctoral Consortium Paper).

6. Mukhopadhyay, Ayan, et al., "Prioritized Allocation of Emergency Responders based on a Continuous-Time Incident Prediction Model", *Proceedings of the 16th Conference on Autonomous Agents and MultiAgent Systems. (AAMAS 2017).*

7. Mukhopadhyay, Ayan, et. al., "Optimal Allocation of Police Patrol Resources Using a Continuous-Time Crime Model", *7th International Conference on Decision and Game Theory for Security. (GameSec 2016)*

8. Zhang, Chao, et al.,"Using abstractions to solve opportunistic crime security games at scale.", *Proceedings of the 2016 International Conference on Autonomous Agents & Multiagent Systems. (AAMAS 2016)*

Peer-reviewed Workshops

1. Mukhopadhyay, Ayan; Vorobeychik, Yevgeniy, "A Pipeline for Emergency Response", *The ICLR-19 Workshop on AI for Social Good (AISC at ICLR 2019)* **[Best Paper Award]**

2. Mukhopadhyay, Ayan, et al., "Prioritized allocation of emergency responders based on a continuous-time incident prediction model", *The AAMAS-17 Workshop on Adversarial Reasoning in Multi-agent Systems (ADVERSE 2017)*

3. Mukhopadhyay, Ayan, et al., "Optimal allocation of police patrol resources using a continuous-time crime model", *The AAAI 2017 Spring Symposium on AI for Social Good (AAAI-AISOC 2017)*

Working Papers

1. Mukhopadhyay, Ayan, et. al., "Automated counting of monarch butterfly clusters"

2. Dao, Tina, et. al., "Wildfire Propagation and Resource Management under Uncertainty"

Patents

1. Mukhopadhyay Ayan, et al., "A Security Device", Reference: E-2/2217/2013-KOL, Application: 616/KOL/2012. (Publication and Patent Pending)

2. Narsaria, Ankit et al., "Hybrid Car Power Transition Mechanism", *Official Journal Of The Patent Office, Government of India, Issue No. 31/2012.* (Patent Pending)

Software

StatResp: An open-source tool for first-responders consisting of statistical methods for emergency response.

Professional Activities

Reviewing (Peer reviewed conferences)
AAMAS (2019, 2017), IJCAI (2018), AAAI (2018), GameSec (2018)

Reviewing (Journals)
Artificial Intelligence Review, IEEE Access

Committee Member
AI for Social Good 2020 (PC Member), AAMAS-18 (Organizing Committee), Opt-Mas at AAMAS-20 (PC Member)

Coursework

Machine Learning, Deep Learning, Statistical Analysis, Advanced Artificial Intelligence, Advanced Statistical Computing, Computational Economics, Linear Optimization

Teaching & Mentoring

Teaching (EECS, Vanderbilt University)
Teaching Assistant, Artificial Intelligence (Under-Graduate Level), 2016
TA Evaluation : 4.2/5 (16% above dept. average)

Teaching Assistant, Machine Learning (Graduate Level), 2017
TA Evaluation : 4.6/5 (21% above dept. average)

Students Mentored
1. Undergraduates (as part of research programs at the Computational Economics Research Lab)
a) Zilin Wang

2. High-School Students (as part of research internships at Vanderbilt University)
a) Chaitu Konjeti
b) Elom Dumenyo

3. High-School Students (as part of research internships at Stanford University)
a) Sidhart Krishnan

Languages

English (Native), Hindi (Native), Bengali (Proficient)

References

1. Yevgeniy Vorobeychik (PhD Advisor)
Associate Professor,
School of Engg. and Applied Sciences,
University of Washington at St. Louis
yvorobeychik@wustl.edu

2. Abhishek Dubey,
Asst. Professor,
Electrical Engineering and Computer Science,
Vanderbilt University
abhishek.dubey@vanderbilt.edu

2. Mykel Kochenderfer (Post-Doc Advisor),
Asst. Professor,
Aeronautics and Aerospace Engineering/Computer Science,
Stanford University
mykel@stanford.edu