

Aria Khademi

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EDUCATION

The Pennsylvania State University, PA, United States

2015 - Present

- Ph.D. in Informatics (In progress)
- M.S. in Information Sciences and Technology (Obtained in 2020)
- Ph.D. Minor in Statistics (Obtained in 2019)

Kharazmi University, Tehran, Iran.

2013 - 2015

M.S. in Artificial Intelligence

Iran University of Science and Technology, Tehran, Iran.

2008 - 2013

B.S. in Computer Software Engineering

RESEARCH EXPERTISE AND INTERESTS

Artificial Intelligence, Machine Learning, Causal Inference, Ethics in Artificial Intelligence, Fairness and Interpretation in Machine Learning, Machine Learning in Health Care

PEER-REVIEWED PUBLICATIONS

1. **Khademi, A.**, Honavar, V. (2020) Algorithmic bias in recidivism prediction: A causal perspective. In: Proceedings of the AAAI Conference on Artificial Intelligence, Student Abstract Program (Acceptance rate: 48%).
2. **Khademi, A.**, El-Manzalawy, Y., Master, L., Buxton, O. M., Honavar, V. G. (2019). Personalized sleep parameters estimation from actigraphy: A machine learning approach. In: Nature and Science of Sleep, Volume 11, pp. 387-399.
3. **Khademi, A.**, Lee, S., Foley, D., Honavar, V. (2019). Fairness in algorithmic decision making: An excursion through the lens of causality. In: Proceedings of the 2019 Conference on The World Wide Web (WWW-19) pp. 2907-2914 (Acceptance rate: 20%, See [Media Coverage](#) below).
4. **Khademi, A.**, EL-Manzalawy, Y., Buxton, O., Honavar, V. (2018). Toward personalized sleep-wake prediction from actigraphy. In: IEEE EMBS International Conference on Biomedical and Health Informatics (BHI) pp. 414-417 (Oral presentation acceptance rate: 14%).

INVITED PROFESSIONAL ARTICLES

Khademi, A. (2018) Causal reasoning: A fairly overlooked piece in artificial intelligence. In: Intel's Medium, Student Ambassador Program.

MEDIA COVERAGE

On my developed **tool to detect discrimination** on the basis of gender, race, etc., published in WWW-19.

1. **Science News Daily:** <https://www.sciencedaily.com/releases/2019/07/190710121649.htm>
2. **EurekAlert** (The official news-release distribution platform operated by the American Association for the Advancement of Science):
https://www.eurekalert.org/pub_releases/2019-07/ps-uai071019.php
3. **Science Times:** <https://www.sciencetimes.com/articles/23285/20190711/researchers-create-new-ai-tool-for-detecting-unfair-discrimination.htm>
4. **Penn State News:** <https://news.psu.edu/story/580213/2019/07/11/research/using-artificial-intelligence-detect-discrimination>

5. **Phys.org:** <https://phys.org/news/2019-07-artificial-intelligence-discrimination.html>

PROFESSIONAL SERVICE

Paper reviewer: NeurIPS-20, ICML-20, ACM CHIL-20 (Program Committee), NeurIPS-19, PLOS ONE, WMSCI-19.

Invited Judge: Penn State official undergraduate poster exhibition (2018)

HONORS AND AWARDS

1. Travel Scholarship: Association for Advancement of Artificial Intelligence (AAAI) *2020*
2. Travel Award: Penn State College of Information Sciences and Technology *2020*
3. Top 5% Excellent Reviewer: NeurIPS-19 Workshop on Machine Learning for Health *2019*
4. Intel Certificate of Appreciation: AI Student Ambassador Program *2019*
5. Travel Award: Penn State College of Information Sciences and Technology *2019*
6. Intel Corporation: AI Student Ambassador *2018-present*
7. Biomedical Big Data to Knowledge Fellowship *2017-present*
8. Travel Award: Penn State College of Information Sciences and Technology *2018*
9. Ranked top 0.8% among about 30000 contestants of the National Universities Entrance Exam for Graduate Programs in Computer Engineering - Artificial Intelligence *2013*
10. Ranked top 0.2% among about 500000 contestants of the National Universities Entrance Exam for Undergraduate Programs in Mathematics and Physics *2008*
11. Ranked 62nd (top 0.1%) among about 50000 contestants of the National Universities Entrance Exam for Undergraduate Programs in English Major *2008*

RESEARCH EXPERIENCE

- AI Student Ambassador: Intel Corporation** *2018-present*
Manager: Niven Singh
- Fellow: Biomedical Big Data to Knowledge (Penn State)** *2017 to present*
Advisors: Vasant Honavar, Ph.D., Orfeu Buxton, Ph.D.
- Artificial Intelligence Research Lab (Penn State)** *2015 to present*
Advisor: Vasant Honavar, Ph.D.
- Data Mining Lab (Kharazmi University)** *2013 to 2015*
Advisor: Mir Mohsen Pedram, Ph.D.

TEACHING ASSISTANT

Activities included teaching, holding lab sessions, designing home works/exams, office hours, and grading.

Pennsylvania State University:

- Machine Learning for Data Science *Fall 2019, Fall 2018*
- Language, Logic, and Discrete Mathematics *Spring 2017, Spring 2016, Fall 2015*
- Principles of Artificial Intelligence *Fall 2016*

Kharazmi University:

- Data Mining 1 *Spring 2015*
- Machine Learning *Fall 2014*

Iran University of Science and Technology:

- Machine and System Language (Assembly) *Fall 2010*

MENTORING

Pennsylvania State University – The Artificial Intelligence Research Lab:

- Cheng-Kai Chen: Master’s student
- Debmalya Sarkar: Undergraduate intern
- Zeshen You: Undergraduate intern

SELECTED RESEARCH PROJECTS

A Causal Perspective to Interpretation/Explanation in Machine Learning (Python and R): Developing causality-grounded measures, methods, and tools to explain the predictions of high performance black box predictive models to end-users and model developers. Advisor: Dr. Vasant Honavar

AI for Social Good – Detecting Algorithmic Discrimination on the Basis of Socially Protected Attributes Such as Race and Gender (Python and R): To assess whether an AI system discriminates against people of certain protected attributes, we have used techniques of causal inference from observational data to determine if there is a causal link between a protected attribute and the decision produced by the system. Advisors: Dr. Vasant Honavar, Dr. Sanghack Lee

Personalized Sleep Quality Assessment from Low-Cost Time Series Wearable Sensor Data Using Machine Learning (Python): Given time series accelerometer data, we developed five families of person-specific ML algorithms to classify sleep vs. wake and to estimate sleep parameters such as sleep efficiency more accurately than the existing population-level algorithms. Advisors: Dr. Vasant Honavar, Dr. Orfeu Buxton, Dr. Yasser El-Manzalawy

Biomarker Discovery in Inflammatory Bowel Diseases Using Feature Selection (Python and R): We used statistical, machine learning, and network-based feature selection methods to identify biomarkers of inflammatory bowel diseases (IBD) using a large dataset of pediatric IBD metagenomics biopsy samples. Advisor: Dr. Yasser EL-Manzalawy

SELECTED PROFESSIONAL ACTIVITIES AND CERTIFICATES

1. Stanford University certificate for the virtual conference on COVID-19 and AI *Spring 2020*
2. Penn State Institute for Computational and Data Science Workshop on big data *Fall 2019*
3. Penn State Workshop on National Science Foundation grant writing *Fall 2019*
4. Biomedical Big Data to Knowledge **Workshop speaker:** Deep learning and Tensorflow *Spring 2019*
5. Penn State Symposium on Artificial Intelligence *Fall 2018*
6. Carnegie Mellon University Summer School on Causal Discovery *Summer 2018*
7. **Invited Judge:** Penn State undergraduate poster exhibition *Spring 2018*
8. Speaker: Biomedical Big Data to Knowledge spring retreat *Spring 2018*
9. Penn State Graduate Exhibition poster presentation *Spring 2018*
10. Penn State Workshop on grant writing for the National Science Foundation *Fall 2017*
11. Penn State Workshop on grant writing for the National Institutes of Health *Fall 2017*
12. Participant and Moderator: Artificial Intelligence Research Lab meetings at Penn State *2015 - present*

SELECTED COURSES

Pennsylvania State University: Stochastic Processes and Monte Carlo Methods (STAT 515), Regression Analysis and Modeling (STAT 511), Analysis of Discrete Data (STAT 504), Design of Experiments (STAT 503), Regression Methods (STAT 501), Intro to Mathematical Statistics (STAT 415), Intro to Probability Theory (STAT 414), Machine Learning (IST 597), Data Analytics at Scale (DS 410)

Online: Mining Massive Datasets, provided by Stanford University through Coursera Inc. Instructors: Jure Leskovec, Anand Rajaraman, Jeff Ullman. Statement of Accomplishment (Grade achieved: 84.6%)

Kharazmi University: Machine Learning, Mathematics of Machine Learning (Advanced Linear Algebra), Data Mining, Digital Image Processing, Digital Signal Processing

CODING SKILLS

Python, R, Hadoop/MapReduce/Spark/Scala, MATLAB, C/C++, C#, Java, Web Programming