BEEN KIM

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RESEARCH INTERESTS

My research interests include making **human-understandable** machine learning models and algorithms. These provide **powerful and intuitive explanations** to human users. The goal is to leverage both **data and human experts' knowledge** by establishing a **feedback loop** between domain experts and machine learning models. My general approach includes designing Bayesian generative models that can provide intuitive explanations without sacrificing predictive accuracy, and accelerating inference algorithms by using logic-informed prior.

PROFESSIONAL EXPERIENCE

Affiliate Faculty 2015 - Present
Department of Computer Science and Engineering, University of Washington, WA, USA
Research Scientist 2015 - Present
Allen Institute for Artificial Intelligence, WA, USA
Software Engineer 2010 - 2012
MathWorks, MA, USA
- Development of a new framework to interface MATLAB with C/C++

EDUCATION

Ph.D., Massachusetts Institute of Technology, MA, USA 2012 - 2015
Areas of Concentration: Interpretable and Interactive Machine Learning Advisor: Julie Shah
Computer Science and Artificial Intelligence Laboratory (CSAIL)
Committee: Julie Shah (Chair), Cynthia Rudin and Randall Davis
Cumulative GPA: 4.00/4.00
M.Sc., Massachusetts Institute of Technology, MA, USA 2007 - 2010
Thesis: Multiple Relative Pose Graphs for Cooperative Mapping Advisor: John Leonard
Computer Science and Artificial Intelligence Laboratory (CSAIL)
Cumulative GPA: 4.00/4.00
B.Sc., Seoul National University, Korea 2003-2007
Department of Mechanical and Aerospace Engineering Summa Cum Laude
Cumulative GPA: 4.02/4.30

PUBLICATIONS

Examples are not Enough, Learn to Criticize! Criticism for Interpretable Machine Learning 2016
Author: **B. Kim***, R. Khanna*, S. Koyejo*
Conference: Neural Information Processing Systems (NIPS), **Oral presentation**
Mind the Gap: A Generative Approach to Interpretable Feature Selection and Extraction 2015
Author: **B. Kim**, F. Doshi-Velez, J. Shah
Conference: Neural Information Processing Systems (NIPS)
Scalable and interpretable data representation for high-dimensional complex data 2015
Author: **B. Kim**, K. Patel, A. Rostamizadeh, J. Shah
Conference: Association for the Advancement of Artificial Intelligence (AAAI)
Inferring Team Task Plans from Human Meetings: A Generative Modeling Approach with Logic-Based Prior 2014
Author: **B. Kim**, C. Chacha, J. Shah
Journal: Journal of Artificial Intelligence Research (JAIR)
Bayesian Case Model: A Generative Approach for Case-Based Reasoning and Prototype Classification 2014
Author: **B. Kim**, C. Rudin and J. Shah

Conference: Neural Information Processing Systems (NIPS)
Learning about meetings 2014
Author: **B. Kim** and C. Rudin
Journal: Data Mining and Knowledge Discovery (DMKD)
Human-inspired Techniques for Human-Machine Team Planning (AAAI Tech Report) 2013
Author: J. Shah, **B.Kim** and S. Nikolaidis
Inferring Robot Task Plans from Human Team Meetings: A Generative Modeling Approach with Logic-Based Prior 2013
Author: **B. Kim**, C. Chacha, J. Shah
Conference: Association for the Advancement of Artificial Intelligence (AAAI)
Quantitative Estimation of the Strength of Agreements in Goal-Oriented Meetings 2013
Author: **B. Kim**, L. Bush, J. Shah
Conference: International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)
Multiple Relative Pose Graphs for Robust Cooperative Mapping 2010
Author: **B. Kim**, M. Kaess, L. Fletcher, J. Leonard, A. Bachrach, N. Roy and S. Teller
Conference: International Conference on Robotics and Automation (ICRA) 2010

INVITED TALKS

Machine learning seminar, University of Washington	Jan. 2017
University of Cambridge	July. 2016
Lunch Seminar Series, California Institute of Technology	April 2016
Computer Science Engineering Women's Research Day, University of Washington	Jan. 2016
Keynote speech at WiML at NIPS	Dec. 2015
Data/Analytics/Machine Learning MeetUp, Seattle WA	Nov. 2015
Microsoft Research, Redmond, WA	Oct. 2015
University of Washington, WA	Oct. 2015
IBM Thomas J. Watson Research Center, NY	Jan. 2015
Google Research NYC, NY	July 2014
Boston university, MA	June 2014

RESEARCH PROJECTS

Interpretable Models and Interactive Machine Learning (See SELECTED PRESS) 2012 - present
- Developing Bayesian generative models that provide intuitive explanations to users by leveraging case-based reasoning
- Building general interpretable machine learning framework
- Designing machine learning methods that can incorporate human experts' domain knowledge

Logic-based Informative Prior for Bayesian Generative Models 2012 - 2013
- Integrated a logic-based tool Planning Domain Definition Language (PDDL) plan validator (logic based) with a Bayesian generative modeling framework
- Showed significant improvements inferring the content of human team planning conversation data from rescue missions

Data Mining to Learn about Meetings (See SELECTED PRESS) 2012 - 2013
- Performed extensive data mining using discrete optimization to discover quintessential patterns in meetings

Multi-robot Localization and Mapping 2008 -2010
- Developed a multi-robot navigation algorithm that can simultaneously perform localization and mapping using probabilistic modeling
- Demonstrated on an autonomous multi-robot system providing persistent situational awareness for an autonomous forklift and a guide robot

INTERNSHIPS

Google Research, NY, USA   Summer 2014
Research Intern at Machine Learning API team
Development of Bayesian Interpretable models and result visualization
Bain & Company, Seoul, Republic of Korea   Summer 2007
Consulting Research Assistant
Optimization of airline routes; Data search, organization and analysis
iTalknews, CA, USA   Winter 2005
Marketing Assistant
User interface design; Website traffic analysis; Website promotion project organizer

SELECTED PRESS

Talking Machines: Real Human Actions and Women in Machine Learning   2016
Computers that teach by example   2014
MIT news
At Work: Just Say 'Yeah'   2013
Wall Street Journal
How To Win Over Co-Workers And Influence Meetings: Use These 3 Words   2013
Forbes
5 Important Words to Say in Every Business Meeting   2013
Yahoo news
Researchers Discover the Key to Persuasion   2013
ABC news

TEACHING AND MENTORING EXPERIENCE

Committee member   2015
Nan-Chen Chen, PhD student at University of Washington
Real-time Systems and Software   Spring 2013
Department of Aeronautics and Astronautics, MIT
Teaching Assistant
Evaluation: 6.7/7.0
Mentoring undergraduate research students (UROP) at MIT   2012-current
Janelle Mansfield: Meeting data analysis   2012
Caleb ChaCha: Web-based experiment framework development and experiment   2012
(co-author on AAAI 13 and JAIR papers)
Alex Lednev: Visualizing data project   2013
Brittney Johnson: Experiment interface design (co-author on a paper in submission) 2014

PROFESSIONAL SERVICE

Area chair, Neural Information Processing Systems (NIPS)   2017
Program committee, International Conference on Machine Learning (ICML)   2017
Co-organizer, Interpretability for complex systems workshop at NIPS   2016
Co-organizer, Interpretability for machine learning workshop at ICML   2016
Program committee, Association for the Advancement of Artificial Intelligence (AAAI) 2017
Board member, Women in Machine Learning Worshop   2015-present
Reviewer, Neural Information Processing Systems (NIPS)   2016
Program committee, International Joint Conference on Artificial Intelligence (IJCAI)
nominated for outstanding PC   2016
Program committee, Association for the Advancement of Artificial Intelligence (AAAI) 2016
Machine Learning track Committee member
International Joint Conference on Artificial Intelligence (IJCAI)   2015

AAAI Reviewer   2014-2015
Reviewer, International Conference on Intelligent Robots and Systems (IROS)   2012-2015
Reviewer, International Conference on Robotics and Automation (ICRA)   2012-2015

HONORS

AAAI Travel Award Seattle, WA, USA   2013
NIPS WiML Travel Award Lake Tahoe, Nevada, USA   2012
CogSIMA Travel Award San Diego, CA, USA   2012
Vicki Kerrebrock Award MIT, MA, USA   2009
Awarded to Graduate Association of Aero. Astro., MIT
Kwanjeong Educational Foundation Scholarship 50K per year for 2 years, Korea   2007-2009
Best Thesis Presentation Seoul National University, Korea   2007
National Science and Engineering Scholarship Korea   2003-2006
Robot Design and Manufacturing Contest Second Place, Seoul National University, Korea   2005
Academic Excellence Scholarship Seo-Hyun High School, Korea   2000-2003

COMPUTER SKILLS

Languages: C/C++, Python, Java, MATLAB, Simulink
Operating Systems: Linux, Windows, Mac OS

PUBLIC SERVICE

President Korean Aero. Astro. Association, MIT   2010 - 2011
International Student Chair Graduate Association of Aero. Astro., MIT   2007 - 2008
08 Graduate Student Orientation Organizer Graduate Student Council, MIT   2008
Kwan-jung Scholarship Vice President Kwan-jung Educational Institute, Korea   2007 - 2009
Staff, Buddy Program for International Student Seoul National University, Korea   2006 - 2007
Volunteer: Teacher and Mentor Dream Tree Free School, NGO for Free Education, Korea   2003

REFERENCES

provided upon request.