JANUSZ MARECKI

Principal Scientist

Pasteur Labs
Institute for Simulation Intelligence

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LEGAL STATUS

Citizenship (United States)
Citizenship (European Union)

LANGUAGES SPOKEN

English (Fluent)
French (Fluent)
Polish (Native)

RESEARCH EXPERTISE

Neural Networks
Reinforcement Learning
Markov Decision Processes
High-Performance Computing
Multi-agent Systems
Game Theory

HIGHLIGHTS

- Two Ph.D. degrees (Artificial Intelligence; Mathematics)
- Habilitation degree rights (Computer Science)
- 20+ years of AI experience
- 10+ years of industry experience (IBM Watson, Google DeepMind)
- 8 United States patents
- 89 rigorously refereed AI publications (top AI journals, conference proceedings, symposia, books)
- US National Science Foundation Advisor (Artificial Intelligence Program), 2012, 2013, 2014, 2015, 2016, 2017
- Invention Awards from IBM CEOs, 2010, 2014
- Commendation from the United States Department of Homeland Security, 2009
- Commendation from the Los Angeles Airport Police, 2009
- Finalist in National Mathematics Olympiad, 1996
- Finalist in Regional Mathematics Olympiad, 1994
- Finalist in Regional Physics Olympiad, 1994

PROFESSIONAL SERVICE

Journals

Reviewer, Autonomous Robots (AR)
Reviewer, Artificial Intelligence Journal (AIJ)
Reviewer, IEEE/ACM Transactions on Networking
Reviewer, IBM Journal of Research and Development
Reviewer, Journal of Parallel and Distributed Computing (JPDC)
Reviewer, Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)
Reviewer, International Journal of Information Technology & Decision Making (IJITDM)

Conferences

Senior Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-17)
Senior Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-16)
Senior Program Committee, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-15)
Senior Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-13)
Co-Chair, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-12)
Program Committee, AAAI Conference on Artificial Intelligence (AAAI-12)
Senior Program Committee, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-12)
Senior Program Committee, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-11)
Program Committee, AAAI Conference on Artificial Intelligence (AAAI-11)
Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-11)
Program Committee, International Conference on Algorithmic Decision Theory (ADT-11)
Program Committee, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-10)
Program Committee, International Conference of Computational Collective Intelligence (ICCCI-10)
Program Committee, International Conference of Computational Collective Intelligence (ICCCI-09)
Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-09)
Program Committee, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-09)
Program Committee, National Conference on Artificial Intelligence, (AAAI-08)
Reviewer, International Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08)
Reviewer, International Joint Conference on Artificial Intelligence (IJCAI-07)

Symposia and Workshops

Organizer, NIPS Workshop on Learning, Inference and Control in MultiAgent Systems (LICMAS-16)
Organizer, IJCAJ Workshop on Cognitive Computing and Applications for Augmented Human Intelligence (CCAAHI-15)
Organizer, AAAI Workshop on Cognitive Computing for Augmented Human Intelligence (CCAHI-14)
Program Committee, AAMAS Workshop on Agent Design: Advancing from Practice to Theory (ADAPT-13)
Organizer, AAAI Fall Symposium on Multi-agent Coordination under Uncertainty (MACU-11)
Organizer, AAAI Workshop on Applied Adversarial Reasoning and Risk Modeling (AARM-11)
Organizer, DIMACS Workshop on Adversarial Decision Making (ADM-10)
Organizer, IJCAI Workshop on Quantitative Risk Analysis for Security Applications (QRASA-09)
Organizer, AAMAS Workshop on Multi-agent Sequential Decision Making (MSDM-09)
Program Committee, AAMAS Workshop on Multi-agent Sequential Decision Making (MSDM-08)
Reviewer, AAAI Spring Symposium on Artificial Intelligence Technologies for Homeland Security (AAAI-SS-05)

Miscellaneous

Panelist, National Science Foundation, Division of Information and Intelligent Systems, Robust Intelligence 2012, 2013,2014, 2015, 2016, 2017
Chair, Artificial Intelligence Professional Interest Community, IBM Watson Research 2013, 2014, 2015
Reviewer, Israeli Science Foundation Proposals, 2010
Producer, “The Madman and the Nun”, The Great Recession Theatre, New York, 2014
Producer, “Confusions of Young Torless”, The Great Recession Theatre, New York, 2012
Producer, “Uncle Vanya”, The Great Recession Theatre, New York, 2009

EDUCATION

08/04-08/08

University of Southern California, Los Angeles, CA
Doctor of Philosophy, Computer Science
Thesis: "Planning with Continuous Resources in Agent Systems"
Advisor: Prof. Milind Tambe; Committee: Prof. Milind Tambe, Prof. Victor Lesser, Prof. Jonathan Gratch, Prof. Fernando Ordóñez, Prof. Rajiv Maheswaran.

06/03-01/05

State Scientific and Research Institute of Information Infrastructure, Lviv, Ukraine
Candidate of Sciences (Ukrainian Doctor of Philosophy)
Mathematical Modeling and Computation Methods
Thesis: "Modeling and Optimization of Ship Service Operation Complexes in the Port"
Advisor: Prof. Volodymyr V. Hrytsyk; Committee: Prof. Dmitrij Sikora, Prof. Bogdan Oleksiv
GPA: 5.0/5.0

08/04-04/07

University of Southern California, Los Angeles, CA
Master of Sciences, Computer Science
Advisor: Prof. Milind Tambe
GPA: 3.8/4.0

10/98-06/03

Jagiellonian University, Cracow, Poland
Magister (Polish Master of Sciences), Computer Science
Thesis: "Intelligent Agent based on Semantic Network"
Advisor: Prof. Mariusz Flasinski
GPA: 4.8/5.0

10/00-06/01

University of Montpellier II, Montpellier, France
Maitrise (French Master of Sciences) Program, Mathematics
Advisor: Prof. Michel Nguiffo Boyom
GPA: 4.3/5.0

09/96-12/98

Academy of Computer Science and Management, Bielsko-Biala, Poland
Inzynier (Polish Bachelor of Sciences), Computer Science
Thesis: "Internet System of Private Colleges"
Advisor: Prof. Antoni Niederlinski
GPA: 4.9/5.0

RESEARCH EXPERIENCE

02/22 - currently

Principal Scientist

Pasteur Labs & ISI

- Reshaping the scientific method for the machine age

08/15-01/22

Senior Research Scientist,

Google DeepMind

- Developed Deep Reinforcement Learning systems for training of multi-agent teams towards increasing the agents' level of cooperation vs. defection under challenging social dilemmas. This research was covered extensively in **major media outlets**: **Bloomberg, Business Insider, Wired**, **World Economic Forum** etc.
- Developed deep neural network architectures capable of mimicking expert level chess play from unstructured training data (later demonstrated in **AlphaGo**).
- Developed an unsupervised deep neural-network learning algorithm for superior **prediction and anomaly detection in high frequency streaming data**.
- Led a team that developed a first-of-a-kind machine intelligence system that combines unsupervised deep learning and model-based hierarchical reinforcement learning into a non-parametric neural network architecture. The system demonstrated superior performance in finding optimal **long-term strategies in partially observable, non-stationary environments**.

11/08-07/15

Research Staff Member,

IBM T.J. Watson Research

Cognitive Computing Division

- Working with **Mars Inc.**, developed novel mycotoxin sampling protocols for improved food safety
- Working with **Statoil**, developed techniques for improving the schedules of oil platform maintenance operations towards reducing the overall production losses
- Working with **Capital One**, developed techniques for improving loan portfolio servicing operations (**US patent filed**)
- Developed techniques for risk-sensitive planning in uncertain environments (**US patent filed**)
- Under a DARPA contract on machine learning algorithms for strategic games, developed MCTS techniques for solving repeated security games played against unknown adversaries (**three US patents issued**)
- Under an International Technology Alliance of US and UK ministry of defense program, developed techniques for planning with delayed observations in uncertain environments (**US patent in preparation**) and techniques for secure information flows with untrusted recipients (**US patent filed**)
- Developed prototypes of Artificial Brain Cognition systems (**US patents in preparation**)
- Developed techniques for adversary deception in planning under uncertainty (**US patent in preparation**)

08/04-08/08

Research Assistant,

University of Southern California

Computer Science Department

Supervisor: Prof. Milind Tambe

- As a member of the TEAMCORE research group, developed techniques for solving continuous resource Markov Decision Processes for single and multi-agent systems.
- As a member of CREATE (Department of Homeland Security center of excellence), co-developed ARMOR, an Assistant for Randomized Monitoring over Routes. Since June 2007 ARMOR generates security checkpoint allocations and canine units patrol routes at the **Los Angeles International Airport**. ARMOR received enthusiastic feedback from the officials at LAX and was covered extensively in the media (Newsweek 09/28/07, Los Angeles Times 10/01/07, Channel 13 News in Los Angeles, 10/07).
- As a member of CREATE (Department of Homeland Security center of excellence), co-developed DEFACTO, a training tool for incident commanders for the **Los Angeles Fire Department**. DEFACTO received a lot of media attention:

Channel 11 and 13 in Los Angeles - 03/06, The Daily Breeze - 03/06, SlashDot - 06/07/07.

- As a subcontractor under DARPA's Coordinators Program developed AutonMod, an adjustable autonomy module to be integrated with the Coordinator System build by Honeywell.

06/02-09/02

Research Associate
European Laboratory for Nuclear Research (CERN)
Supervisor: Prof. Beat Jost

- Developed real time sorting algorithms on the IBM NP4GS3 processors for the Large Hadron Collider beauty experiment (LHCb) aimed at measuring the parameters of CP violation in the interactions of b-hadrons.

09/96-12/98

Undergraduate Research Assistant
Academy of Computer Science and Management
Supervisor: Prof. Antoni Niederlinski

- Developed ISUN, the first Internet Integration System for Private Colleges in Poland.

Research Proposals

1. “Machine Intelligence via Cortical Microcircuits”, IARPA program; assisted with the IBM part of the proposal, 2015.
2. “Saccadic Vision via Hierarchical Temporal Memory”, DARPA proposal; assisted with the IBM part of the proposal, 2014.
3. “Monte Carlo Tree Search”, DARPA Multidisciplinary University Research Initiative (MURI); assisted with the IBM part of the proposal, 2010.
4. "Secure Information Flows", DARPA and UK Ministry of Defense proposal under the International Technology Alliance in Network and Information Sciences Program, approx. funding granted $1,840,000; assisted with the IBM part of proposal, 2009.
5. "Distributed constraint optimization for mobile sensor nets", 1/1/08-12/31/10, approx. funding granted $320,000, Subcontract from Lockheed Martin Advanced Technology Laboratory (DARPA “LANDROID” program); assisted with the University of Southern California part of proposal, 2008.
6. “Air Vehicle Adaptive Information Management System (AVAIMS)”, United States Army Research Laboratory, Multidisciplinary University Research Initiative (MURI); assisted with Perceptronics Solutions, Inc. portion of proposal, 2007.
7. “Micro Autonomous Systems and Technology” (MAST), United States Army Research Laboratory (ARL), Collaborative Technology Alliance (CTA); assisted with University of Southern California portion of proposal, 2006
8. “The Message in a BotL; a Bot Language”, (BOTL), United States Army Research Laboratory, Multidisciplinary University Research Initiative (MURI), 2006; assisted with University of Southern California portion of proposal, 2006
9. “Automatic Generation of Effective Multi Agent Organizations”, United States Army Research Laboratory, Multidisciplinary University Research Initiative (MURI); assisted with University of Southern California portion of proposal, 2006

DEVELOPMENT EXPERIENCE

Neural Network Toolboxes
TENSORFLOW, TORCH, THEANO

Programming languages
C, C++, OBJECTIVE C, CUDA, LUA, JAVA, PYTHON, PERL, SQL, MATLAB, HTML, PHP, TEX, ASSEMBLER, PASCAL, FORTRAN, PROLOG, LISP

Operating systems
UNIX, Linux, OSX, iOS, Windows

Projects

- Developed a machine learning system for automatically detecting car-parking events using a fusion of mobile device sensor readings and differential geometry.
  Implemented in Objective-C; 2016

- Developed a prototype Artificial Brain Cognition system; The system is a spiking neural network with neurons grouped in cortical minicolumns organized in a hierarchy of regions; Implemented in C++ using CUDA & OpenGL libraries for High-Performance Nvidia Graphical Processing Units; 2015

- Developed a technique for Multistage Search for Language Generation Using Syntactic Features.
  Implemented in PYTHON; 2014

- Developed a suite of automated trading agents. The agents employ statistical arbitrage in the ETF space for highly profitable and robust intraday trading strategies.
  Implemented in JAVA; 2013.

- Developed a system for optimizing the servicing of loan portfolios. The system employs continuous action Markov Decision processes to improve the underlying month-to-month delinquency dynamics in a portfolio of loans;
  Implemented in JAVA using CPLEX libraries; 2012

- Developed a system for scheduling oil platform maintenance operations for Statoil-Hydro;
  The system employs Mixed Integer Linear Programs to improve the underlying maintenance schedules;
  Implemented in JAVA using CPLEX libraries; 2011

- Developed a repeated Bayesian Stackelberg game module of the Monte-Carlo-Tree-Search (MCTS) solver;
  MCTS is a state-of-the-art reinforcement learning technique for solving large-scale stochastic optimization problems;
  Implemented in JAVA; 2011

- Developed a system for solving Risk-Sensitive Partially Observable Markov Decision Processes (RS-POMDPs);
  RS-POMDPs are used to model risk-sensitive investment strategies in dynamic, partially observable environments;
  Implemented in JAVA using CPLEX libraries; 2010

- Developed a system for solving Continuous Resource Distributed Markov Decision Processes (CR-DEC-MDPs);
  CR-DEC-MDPs model multi-agent coordination problems where agent actions require continuous resources;
  Implemented in JAVA; 2009

- Developed a system for solving Continuous Resource Markov Decision Processes (CR-MDPs);
  CR-MDPs model multi-stage stochastic optimization problems with limited continuous resources;
  Implemented in JAVA; 2008

- Developed a solver for Network Distributed Partially Observable Markov Decision Processes (ND-POMDPs); ND-POMDPs model multi-agent coordination problems with local agent interaction graphs; Implemented in JAVA; 2008

- Developed the Assistant for Randomized Monitoring Over Routes (ARMOR 1.0) system for scheduling the security checkpoints at the Los Angeles International Airport; Implemented in JAVA; 2007

- Developed the Adjustable Autonomy module for the Honeywell system of the DARPA Coordinators program; Implemented in LISP with JAVA modules; 2006

- Developed the DEFACTO system for training the incidents commanders of the Los Angeles Fire Department for an event of a large-scale urban disaster. DEFACTO combines MACHINETTA (distributed multi-agent platform), Adjustable Autonomy agent-human role allocation algorithms and Robocup Rescue Simulation visualizer; Implemented in JAVA; 2005

- Developed a logistic system for servicing of ships in ports; The system uses heuristic optimization methods to find locally optimal dates and quays for ship unloading and loading operations in a variety of port configurations; Implemented in C++; 2004

- Developed a HVAC system controller where individual controller parts formed a distributed multi-agent system; Implemented in C++; 2003

- Developed ERASM, a custom-made programming language with its own compiler; Implemented in C++; 2002

- Developed real time sorting algorithms on the IBM NP4GS3 processors for the Large Hadron Collider beauty experiment (LHCb) aimed at measuring the parameters of CP violation in the interactions of b-hadrons; Implemented in IBM NP4GS3 ASSEMBLY language; 2002

- Developed an Artificial Intelligence module for the classic “Battleship” game; Implemented in LISP; 2001

- Developed an interpreter and a 3D visualizer for complex mathematical functions; Implemented in PASCAL; 1999

- Developed a first-of-a-kind Internet System for the Coordination of Private Colleges in Poland (ISUN). Implemented in HTML and PERL; 1998

- Developed a client relational database system; Implemented in Objective C++; 1996

- Developed an Artificial Intelligence module for the classic “Battleship” game; Implemented in PASCAL; 1994

MENTORING EXPERIENCE

IBM T.J. Watson Research

- Supervised Xiaojian Wu, an IBM Research summer intern who developed techniques for Multistage Search for Language Generation Using Syntactic Features, 2014

- Supervised Fei Fang, an IBM Research summer intern who developed techniques for finding optimal goal-directed trajectories of mixed strategies of the leader in context of repeated Stackelberg games, 2013

- Supervised the IBM &UCLA Research in Industrial Projects work on "Adversary Deception in Planning Under Uncertainty". Students involved: Leon Chang (Columbia University), Joseph Durgin (Bowdon College), Fanni Selley (Eotvos Lorand University) and Katherine Todd (University of Hawaii), 2011

Academy of Computer Science, Poland
Position held: 2002-2004, Lecturer; 2005-2007, Adjunct Lecturer; 2008-2017, Professor

Classes taught:
- "Data Structures" class (INF SD), Fall 2005
- "Data Structures" class, (INF SD), Spring 2003
- "Data Structures" class, (INF SD), Fall 2002
- "Data Structures" class, (INF SD), Spring 2002
- "Methods of Artificial Intelligence" (INF MSI), class, Fall 2002
- "Methods of Artificial Intelligence" (INF MSI), class, Spring 2002

Undergraduate theses supervised:
- "Multimedia Website of the "Quick Dance" Bielsko School of Dance", Lukasz Zdeb, 2011
- "Computer System for Ambulance Routing", Marcin Cul, 2011
- "Simulator of Ship Scheduling in Ports", Mariusz Olbrzymek, 2011
- "Computer Business Game for Education", Sebastial Drozda, 2010
- "Internet Tutoring System for the "Artificial Intelligence" Course, 2010
- "Computer System for Solving the Rubix Cube", Grzegorz Kusiak, 2010
- "System for Assisting the Fire Department Dispatchers", Piotr Przeciszowski, 2008
- "Internet System for Directing Traffic at an Intersection", Miroslaw Schab, 2008
- "Internet Reservation System for Sailboats", Bogdan Jager, 2008
- "Internet System for Reconnaissance Planes", Arkadiusz Janik, 2008
- "Internet System for the Management of Emergency Responders in a City", Pawel Michalski, 2008
- "Internet System for the WSIZ Faculty", Lukasz Kusznierewicz, 2008
- "Internet Tutoring System for the "Digital Arithmetic" Course", Lukasz Duraj
- "Internet System for Individual Plan of Studies", Michal Tonderski, 2007
- "Internet System for the Digital Arithmetic Class, Lukasz Duraj, 2007
- "Computer System for Optimizing the Transport of Children to a School", Michal Glajc, 2007
- "Operation Control for a Service Brigade in a Coal Mine", Karol Gulan, 2006
- "Analysis of Data Structures for the Rubic's Cube", Pawel Pawlus, 2006
- "Internet Decision Support System for the Distribution of Drinking Water", Adam Broszkowski, 2006
- "Internet System for the Management of a Recreational Center", Marta Krol, 2006
- "Internet System for Student Polls", Pawel Zborkowski, 2006
- "Computer System for Remodeling of Plastic Bottles", Maciej Kowalik, 2005

- "Computer System for Measuring the Time Spent at Work in a Company", Dorota Kowalik, 2005
- "Analysis of E-mail Filters", Jacek Krenzel, 2005

University of Southern California, Computer Science Department, Los Angeles, USA
Graduate Teaching Assistant for the “Software Multi Agent Systems” class (CSCI 543), Spring 2006

Jagiellonian University, Computer Science Department, Cracow, Poland
Guest lecturer for the “Probabilistic Methods of Artificial Intelligence” class (INF MSI), 03/14/02
Guest lecturer for the “Probabilistic Methods of Artificial Intelligence” class (INF MSI), 12/09/02

Textbooks for students (Published by Jacek Skalmierski Computer Studio)
- “Automata, Formal Languages and Algorithms”, 2004
- “Graphs and Recursions”, 2002
- “Methods of Artificial Intelligence”, 2001
- “Data Structures”, 2000

PATENTS

1. "Agent Security via Approximate Policies (ASAP): An approximate algorithm for solving bayesian Stackelberg games"; Praveen Paruchuri, Janusz Marecki, Jonathan Pearce, Sarit Kraus, Fernando Ordonez and Milind Tambe; Issued, United States 8,364,511 B2; Patent in use by ARMORWAY Inc.
2. "Decomposed Optimal Bayesian Stackelberg Solver (DOBSS): An optimal algorithm for solving bayesian Stackelberg games", Praveen Paruchuri, Janusz Marecki, Jonathan Pearce, Sarit Kraus, Fernando Ordonez and Milind Tambe; Issued, United States 8,224,681 B2; Patent in use by ARMORWAY Inc.
3. "Optimal Policies using Repeated Stackelberg Games with Unknown Player Preferences"; Janusz Marecki, Gerry Tesauro, Richard Segal; Issued, United States 8,545,332 B2;
4. "Risk Sensitive Investment Strategies under Partially Observable Market Conditions"; Janusz Marecki; Filed, United States 20110282801 A1;
5. "System and Method for Secure Information Sharing with Untrusted Recipients"; Janusz Marecki and Mudhakar Srivatsa; Filed, United States 20120047103 A1;
6. "Multistage Optimization of Asset Health versus Costs to Meet Operation Targets"; Janusz Marecki, Marek Petrik, Dharmashankar Subramanian, Ruslan Starushok, Chitra Dorai; Filed provisional, YOR820130213US

PUBLICATIONS

Journal Articles

1. *"Framework for Managing Mycotoxin Risks in the Food Industry"*, Robert C. Baker, Randall M. Ford, Mary E. Helander, Janusz Marecki, Ramesh Natarajan and Bonnie Ray, Journal of Food Protection, Vol. 77, No. 12, 2014, pp. 2181–2188.
2. "Introducing Communication in Dis-POMDPs with Locality of Interaction", Makoto Tasaki, Yuichi Yabu, Yuki Iwanuri, Makoto Yokoo, Janusz Marecki, Pradeep Varakantham and Milind Tambe, *Journal of Web Intelligence and Agent Systems (WIAS), 2010 Vol. 8, No. 3 pp 8.*
3. "Coordinating Randomized Policies for Increasing Security of Agent Systems", Praveen Paruchuri, Jonathan P. Pearce, Janusz Marecki, Milind Tambe, Fernando Ordonez and Sarit Kraus. In *Journal of Information Technology and Management (ITM), 2009*.
4. "Towards Flexible Coordination of Human-Agent Teams", Nathan Schurr, Janusz Marecki and Milind Tambe, In *Multiagent and Grid Systems - An International Journal (MAGS)*, 2006, pp. 1:3-16.
5. "Mathematical Models and Scheduling Methods for Serial-Parallel Service Systems", Janusz Marecki, In *Information Technologies and Systems, 2003, vol. 6, number 1-2, pp.140-147.*
6. "Computer Modeling of Serial-Parallel Service Systems", Janusz Marecki, In *Journal of Podilla Univercity of Technology, 2003, vol.1, number 3, pp.142-148.*
7. "Planning in Semantic Network using Node Nested Grammars", Janusz Marecki, In *Artificial Intelligence (AI), Journal of the Ukrainian Academy of Sciences*, 2003, pp.4:421-429.

Conference Papers

8. "Multi-agent Reinforcement Learning for Sequential Social Dillemas", Joel. L. Leibo, Vinicius Zambaldi, Marc Lanctot, Janusz Marecki, Thore Graepel, *In Proceedings of the Sixteenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2017), pp.9*

9. "Solution Methods for Constrained Markov Decision Process with Continuous Probability Modulation", Janusz Marecki, Marek Petrik, Dharmashankar Subramanian, *In Proceedings of the 29th Conference on Uncertainty in Artificial Intelligence (UAI-2013), pp. 9.*
10. "Playing Repeated Stackelberg Games with Unknown Opponents", Janusz Marecki, Gerry Tesauro and Richard Segal, *In Proceedings of the Eleventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-2012), pp.8.*
11. "Delayed Observation Planning in Partially Observable Domains", Pradeep Varakantham and Janusz Marecki, Extended abstract *In Proceedings of the Eleventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-2012), pp.2.*
12. "Approximation Methods for Infinite Bayesian Stackelberg Games: Modeling Distributional Payoff Uncertainty", Christopher Kiekintveld, Janusz Marecki and Milind Tambe In *Proceedings of the Tenth International Joint Conference on Autonomous Agents and Multi-agent systems (AAMAS-2011), pp.8*
13. "Multiagent Communication Security in Adversarial Settings", Steven Okamoto, Praveen Paruchuri, Yonghong Wang, Katia Sycara, Janusz Marecki and Mudhakar Srivatsa In *Proceedings of the IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT-2011), pp.8*
14. "Methods and Algorithms for Infinite Bayesian Stackelberg Security Games", Christopher Kiekintveld, Janusz Marecki and Milind Tambe In *Proceedings of the Conference on Decision and Game Theory for Security (GAMESEC-2010), pp.12*
15. "A Decision Theoretic Approach to Data Leakage Prevention", Janusz Marecki, Mudhakar Srivatsa and Pradeep Varakantham In *Proceedings of the Second IEEE Conference on Privacy, Security, Risk and Trust (PASSAT-2010), pp.8*
16. "ALARMS: Alerting and Reasoning Management System for Next Generation Aircraft Hazards", Nathan Schurr, Alan Carlin and Janusz Marecki, In *Proceedings of the Twenty-Sixth Conference on Uncertainty in Artificial Intelligence (UAI-2010), pp.6*
17. "Risk Sensitive Planning in Partially Observable Environments", Janusz Marecki and Pradeep Varakantham, In *Proceedings of the Ninth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-10), pp.8.*
18. "Robust Bayesian Methods for Stackelberg Security Games", Christopher Kiekintveld, Janusz Marecki and Milind Tambe, *Short paper in Proceedings of the Ninth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-10), pp. 2.*
19. "Function Allocation for NextGen Airspace via Agents", Nathan Schurr, Paul Picciano and Janusz Marecki, In *Proceedings of the Industry Track of the Ninth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-10), pp.8.*
20. "Exploiting Coordination Locales in Distributed POMDPs via Social Model Shaping", Pradeep Varakanthham, Junyoung Kwak, Matthew Taylor, Janusz Marecki, Paul Scerri and Milind Tambe, In *Proceedings of the Nineteenth International Conference on Automated Planning and Scheduling (ICAPS-09).*
21. "Planning with Continuous Resources for Agent Teams", Janusz Marecki and Milind Tambe, In *Proceedings of the Eight International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-09), pp.1089-1096*
22. "Improving Adjustable Autonomy with Continuous Time", Nathan Schurr, Janusz Marecki and Milind Tambe, In *Proceedings of the Eight International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-09), pp.353-360.*
23. "Towards Faster Planning with Continuous Resources in Stochastic Domains", Janusz Marecki and Milind Tambe, In *Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence (AAAI-08).*
24. "Efficient Algorithms to Solve Bayesian Stackelberg Games for Security Applications", Praveen Paruchuri, Jonathan P. Pearce, Janusz Marecki, Milind Tambe, Fernando Ordonez and Sarit Kraus. In *Proceedings of the Nectar Paper Track of the Twenty-Third AAAI Conference on Artificial Intelligence (AAAI-08).*
25. "Security via Randomization: A Game Theoretic Model and its Application at the Los Angeles International Airport", James Pita, Milind Tambe, Fernando Ordonez, Christopher Portway, Craig Western, Manish Jain, Janusz Marecki, Praveen Paruchuri and Sarit Kraus, In *Proceedings of the IEEE International Conference on Technologies for Homeland Security (HTS-08).*
26. "ARMOR: Security via Randomization for the Los Angeles International Airport", James Pita, Milind Tambe, Fernando Ordonez, Christopher Portway, Craig Western, Manish Jain, Janusz Marecki, Praveen Paruchuri and Sarit Kraus, In *Proceedings of the Industry Track of the International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08).*

27. "Playing games for Security: An Efficient Exact Algorithm for Solving Bayesian Stackelberg Games", Praveen Paruchuri, Jonathan Pearce, Janusz Marecki, Milind Tambe, Fernando Ordonez and Sarit Kraus, In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08)*.
28. "Not All Agents are Equal: Scaling up Distrubuted POMDPs for Agent Networks", Janusz Marecki, Tapana Gupta, Pradeep Varakantham, Milind Tambe and Makoto Yokoo, In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08)*.
29. "RIAACT: A Robust Approach to Adjustable Autonomy for Human - Multiagent Teams", Nathan Schurr, Janusz Marecki and Milind Tambe, *Short paper in Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08)*.
30. "Introducing Communication in Dis-POMDPs with Locality of Interaction", Makoto Tasaki, Yuichi Yabu, Yuki Iwanuri, Makoto Yokoo, Milind Tambe, Janusz Marecki and Pradeep Varakantham, In *Proceedings of the IEEE/WIC International Joint Conference on Web Intelligence and Intelligent Agent Technology (IAT-08)*.
31. "On Opportunistic Techniques for Solving Decentralized MDPs with Temporal Constraints", Janusz Marecki and Milind Tambe, In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-07)*, Honolulu, Hawaii, USA, May 14-18, 2007.
32. "Letting loose a SPIDER on a network of POMDPs: Generating quality guaranteed policies", Pradeep Varakantham, Janusz Marecki, Milind Tambe and Makoto Yokoo, In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-07)*, Honolulu, Hawaii, USA, May 14-18, 2007.
33. "A Fast Analytical Algorithm for Solving Markov Decision Processes with Real-Valued Resources", Janusz Marecki, Sven Koenig and Milind Tambe, In *Proceedings of the Twentieth International Joint Conference on Artificial Intelligence (IJCAI-07)*, Hyderabad, India, January 6-12, 2007, pp. 2536-2541.
34. "The DEFACTO System: Training Tool for Incident Commanders", Nathan Schurr, Janusz Marecki, Paul Scerri, J.P. Lewis and Milind Tambe, In *Proceedings of the Seventeenth Conference on Innovative Applications of Artificial Intelligence (IAAI-05)*, Pittsburgh, PA, July 9-13, 2005, pp. 1555-1562.
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52. “Dangers in Multiagent Rescue using DEFACTO”, Janusz Marecki, Nathan Schurr, Milind Tambe and Paul Scerri, In *Lecture Notes in Computer Science (LNCS)*, 2008.
53. "Agent-based Simulations for Disaster Rescue Using the DEFACTO Coordination System", Janusz Marecki, Nathan Schurr and Milind Tambe, *Book Chapter in "Emergent Information Technologies and Enabling Policies for Counter Terrorism"*, Wiley-IEEE Press, 2005.
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58. “Acting in Partially Observable Domains with Delayed Observations”, Pradeep Varakantham and Janusz Marecki, *In Annual Conference of International Technology Alliance (ACITA-10*), Imperial College, London, United Kingdom, September 14, 2010.
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61. “Robust Bayesian Methods for Stackelberg Security Games”, Christopher Kiekintveld, Milind Tambe and Janusz Marecki, *In Annual Conference of International Technology Alliance (ACITA-10*), Imperial College, London, United Kingdom, September 13, 2010.
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66. "A Fast Analytical Algorithm for Markov Decision Process with Continuous State Spaces", Janusz Marecki, Zvi Topol and Milind Tambe, In *Proceedings of the Eighth Workshop on Game Theoretic and Decision Theoretic Agents (GTDT-06) held at the Fifth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-06)*, Hakodate, Japan, May 8-12, 2006.
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68. "The Future of Disaster Response: Humans Working with Multiagent Teams using DEFACTO", Nathan Schurr, Janusz Marecki, Milind Tambe, J. P. Lewis and Nikhil Kasinadhuni, In *Proceedings of American Association for Artificial Intelligence Spring Symposium (AAAI-SS-05) on Artificial Intelligence Technologies for Homeland Security*, Menlo Park, CA, March 21-23, 2005.
69. “LHCb Level 1 Trigger - Real Time Sorter”, Janusz Marecki, *Workshop on LHCb Level 1 Trigger held at the European Laboratory for Nuclear Research*, Geneva, Switzerland, August 2002. 25 p.
70. “Modeling of Real Time Sorters”, Janusz Marecki, *Workshop on LHCb Level 1 Trigger held at the European Laboratory for Nuclear Research*, Geneva, Switzerland, August 2002, 23 p.
71. "Mathematical Schedule Modeling of Ships in Ports", Zbigniew Frackiewicz, Janusz Marecki, *Workshop on Management and Artificial Intelligence*, *National Academy of Sciences of Ukraine*, *Institute of Information Infrastructure*, Lviv, Ukraine, May 20-25, 2002, pp. 74-86.
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Technical Reports

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87. "Mathematical Model of Ship Scheduling in a Parallel Structure Port", Janusz Marecki, In *Academy of Computer Science Press*, Bielsko-Biala, Poland, 2001, vol. 12/01, pp. 40-46.
88. "Logistic Models of Ship Scheduling in a Single Wharf Port", Janusz Marecki, In *Academy of Computer Science Press*, Bielsko-Biala, Poland, 2001, vol. 11/01, pp. 80-91.
89. "Logistic Models of Ship Scheduling in a Port", Janusz Marecki, In *Academy of Computer Science Press*, Bielsko-Biala, Poland, 2001, vol. 10/01, pp. 35-43.

Theses

86. "Planning with Continuous Resources in Agent Systems" Doctor of Philosophy thesis, University of Southern California, Los Angeles, California, USA, May 7, 2008.
87. "Modeling and Optimization of Ship Service Operation Complexes in the Port", Candidate of Sciences Thesis, Institute of Information Infrastructure, Lviv, Ukraine, January 5, 2005.
88. "Intelligent Agents based on Semantic Networks", Master of Sciences thesis, Jagiellonian University, Cracow, Poland, June 2003.
89. "Internet System for Private Colleges in Poland" Bachelor of Sciences thesis, Academy of Computer Science and Management, Bielsko-Biala, Poland, December 1998.

PRESENTATIONS

Invited Talks

1. "Towards Understanding of Big Data Streams", Keynote at the Big Data & Analytics Innovation Summit, Shanghai China, September 6, 2017.
2. "Towards the Future of Intelligence ", Keynote at the Heroes | Euro Mediterranean Co-Innovation Festival, Maratea, Italy, September 21, 2017.
3. "Towards the Future of Intelligence", Brainly Technological MeetUp, Cracow, January 30, 2017
4. "Single & Multistage Bayesian Stackelberg Games with Unknown Player Preferences", Carnegie Mellon University, September 30, 2014.
5. "Towards Conquering Uncertainty in Agent Systems”, Czech Technical University in Prague, November 19, 2010.
6. "Playing in the Dark: On Solving Single/Multistage Bayesian Stackelberg Games with Unknown Player Preferences", University of Southern California, Los Angeles, October 25, 2010.
7. "Planning with Continuous Resources in Agent Systems", Research Triangle Institute, Research Triangle Park, North Carolina, August 13, 2010.
8. "Towards Conquering Uncertainty in Agent Systems", Rutgers University, New Brunswick, New Jersey, May 24, 2010.
9. "Allocation of Continuous Resources in Agent Systems: Towards Conquering Uncertainty", University of Massachusetts, Amherst, Massachusetts, October 6, 2009.

10. "A Quest for Intelligence: From Stochastic Optimization to Cortex Simulations", University of Southern California, Los Angeles, California, August 26, 2009.
11. "Towards Conquering Uncertainty in Agent Systems", Institute of Creative Technologies, Los Angeles, California, USA, April 4, 2008.
12. "Towards Conquering Uncertainty in Agent Systems", Carnegie Mellon University, Pittsburgh, Pennsylvania, March 19, 2008.
13. "Towards Conquering Uncertainty in Agent Systems", IBM T.J. Watson Research, Yorktown Heights, New York, March 5, 2008.
14. "Towards Conquering Uncertainty in Agent Systems", Drexel University, Philadelphia, Pennsylvania, March 3, 2008.
15. "Planning with Continuous Time in Single/Multiagent Systems", Honeywell Laboratories, Minneapolis, Minnesota, February 15, 2007.

Conferences

16. “Solution Methods for Constrained Markov Decision Process with Continuous Probability Modulation”, Twenty-Ninth Conference on Uncertainty in Artificial Intelligence, Bellevue, Washington, USA, July 14, 2013.
17. “Playing Repeated Stackelberg Games with Unknown Opponents”, Eleventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-12), Valencia, Spain, June 6, 2012.
18. “Methods and Algorithms for Infinite Bayesian Stackelberg Security Games”, Conference on Decision and Game Theory for Security (GAMESEC-10), Berlin, Germany, November 23, 2010.
19. “Risk-Sensitive Planning in Partially Observable Environments”, Ninth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-10), Toronto, Canada, May 14, 2010.
20. “Towards Faster Planning with Continuous Resources in Stochastic Domains”, Twenty-Third AAAI Conference on Artificial Intelligence (AAAI-08), Chicago, Illinois, July 16, 2008.
21. “Playing games for Security: An Efficient Exact Algorithm for Solving Bayesian Stackelberg Games”, Seventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08), Estoril, Portugal, May 14, 2008.
22. “Not All Agents are Equal: Scaling up Distrubuted POMDPs for Agent Networks” Seventh International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-08), Estoril, Portugal, May 16, 2008.
23. “On Opportunistic Techniques for Solving Decentralized MDPs with Temporal Constraints”, Sixth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS-07), Honolulu, Hawaii, USA, May 18, 2007.
24. “A Fast Analytical Algorithm for Solving Markov Decision Processes with Real-Valued Resources”, Twentieth International Joint Conference on Artificial Intelligence (IJCAI-07), Hyderabad, India, January 11, 2007.
25. “Representing Time Intervals in Semantic Network” International Conference on Problems of Decision Making under Uncertainties (PDMU-03), Alushta, Ukraine, September 8-12, 2003
26. "Logistical ships scheduling model in serial structure port", Tenth International Conference on Naval Movement Engineering (IRM-03), Swinoujscie, Poland, November 2003.
27. "Logistical ships scheduling model in parallel structure port" Tenth International Conference on Naval Movement Engineering (IRM-03), Swinoujscie, Poland, November 2003.
28. "Modelling of Decision Trees", The First International Conference on Inductive Modelling (ICIM-02), Lviv, Ukraine, May 25, 2002.

Symposia and Workshops

29. “Deep Reinforcement Learning in Games Research”, Reinforcement Learning Workshop at NIPS 2015.

30. “Towards Acting Strategically in Adversarial Settings: Getting to Know and Deceiving your Foes”, Agent Technology for Safety, Security and Efficiency of Critical Infrastructures (SSECI) Workshop, Czech Technical University in Prague Agent Technology Center, Prague, Czech Republic, June 2, 2012.
31. “Artificial Brain: A Prototype”, Use-inspired Agents and Multiagent Systems Workshop, University of Southern California, Los Angeles, March 24, 2011.
32. “Information Security Risk Modeling”, Modeling and Understanding Risk: A Cross-Section of Perspectives Workshop, University of Maryland, College Park, March 4, 2011.
33. “Robust Bayesian Methods for Stackelberg Security Games”, Annual Conference of International Technology Alliance (ACITA-10), Imperial College, London, United Kingdom, September 13, 2010.
34. “Risk-Sensitive Planning in Partially Observable Environments”, Annual Conference of International Technology Alliance (ACITA-10), Imperial College, London, United Kingdom, September 13, 2010.
35. “Artificial Brain”, IBM T.J. Watson Research, Yorktown Heights, New York, USA, March 4, 2010.
36. “Risk Sensitive Planning in Partially Observable Domains”, IBM T.J. Watson Research, Yorktown Heights, New York, USA, June 26, 2009.
37. “Playing games for Security at the Los Angeles International Airport” IBM T.J. Watson Research, YorktownHeights, New York, USA, May 15, 2009.
38. “Not All Agents are Equal: Scaling up Distributed POMDPs for Agent Networks” Multiagent Sequential Decision Making Workshop (MSDM-08) held at the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-08), Estoril, Portugal, May 12, 2008.
39. "A Fast Analytical Algorithm for solving MDPs with Real Valued Resources", International Workshop on Methods and Applications of Artificial Intelligence, Academy of Computer Science, Bielsko-Biala, Poland, December 15, 2007.
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41. “SPIDER Attack on a Network of POMDPs: Towards Quality Bounded Solutions” American Association for Artificial Intelligence Spring Symposium (AAAI-SS-07) on Game Theoretic and Decision Theoretic Agents (GTDT-07), Stanford University, Menlo Park, California, USA, March 27, 2007.
42. "A Fast Analytical Algorithm for Markov Decision Process with Continuous State Spaces" Eighth Workshop on Game Theoretic and Decision Theoretic Agents (GTDT-06) held at the Fifth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-06), Hakodate, Japan, May 9, 2006.
43. "Dangers in Multi Agent Rescue using DEFACTO" Second International Workshop on Safety and Security in Multiagent Systems (SASEMAS-05) held at the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05), Utrecht, The Netherlands, July 25, 2005.
44. “LHCb Level 1 Trigger - Real Time Sorter”, Workshop on LHCb Level 1 Trigger held at the European Laboratory for Nuclear Research, Geneva, Switzerland, August 2002.
45. "Data Structures" Workshop on Management and Informatics Systems, Academy of Computer Science, Bielsko-Biala, Poland, September 1999.

REFERENCES

Gerry Tesauro, *AAAI Fellow*
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