Abdeslam Boularias — March 2023

Current Position Associate Professor at Rutgers University

Contact Information

Department of Computer Science
Rutgers University
110 Frelinghuysen Road, Piscataway, NJ, 08854

Phone: 412-681-6961
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Research Interests

Theory: Machine Learning, Robot Learning, Planning, Reinforcement Learning
Applications: Robotic Grasping and Manipulation, Robot Vision, Automation, Imitation Learning, Behavior Modeling, Natural Language User Interfaces

Educational Background

Laval University, Québec, Canada

Ph.D. in Computer Science, July 2010

- Topic: Predictive Representations For Sequential Decision Making Under Uncertainty
- Committee: Brahim Chaib-draa, Joelle Pineau, Abdel-Illah Mouaddib, Philippe Giguère

Paris-Sud University (Paris XI), Orsay, France

M.S. in Computer Science, September 2005

École Nationale Supérieure d'Informatique, Algiers, Algeria

B.S. in Computer Engineering, October 2004

Research Experience

Rutgers, The State University of New Jersey
July 2021 - now
Associate Professor — New Brunswick, USA

Rutgers, The State University of New Jersey
September 2015 - June 2021
Assistant Professor — New Brunswick, USA

National Robotics Engineering Center, Carnegie Mellon University
May 2015 - August 2015
Project Scientist — Pittsburgh, USA

National Robotics Engineering Center, Carnegie Mellon University
May 2013 - May 2015
Postdoctoral Fellow — Pittsburgh, USA

Max Planck Institute for Intelligent Systems
August 2010 - May 2013
Research Scientist — Tübingen, Germany

Laval University
January 2006 - August 2010
Graduate Research Assistant — Québec, Canada

INRIA
March 2005 - October 2005
Internship — Orsay, France

École Nationale Supérieure d'Informatique
October 2003 - October 2004
Internship — Algiers, Algeria

External Recognition

NSF CAREER Award: "Task-Oriented Model Identification for Robust Robotic Manipulation", 2019.

Best Automation Paper Award Finalist: "Towards Robust Product Packing with a Minimalistic End-Effector", ICRA 2019.
Best Cognitive Robotics Paper Award: "Learning to Ground Spatial Relations for Outdoor Robot Navigation", ICRA 2015.

Teaching Experience

Rutgers, The State University of New Jersey, Piscataway, US

1. Robot Learning (CS 672, graduate course) **Spring 2021**
   Enrollment: 12 students
   Teaching Effectiveness Rating: 4.5/5
   Course Quality Rating: 4.5/5
2. Introduction to Artificial Intelligence (CS 520, graduate course) **Fall 2020**
   Enrollment: 21 students
   Teaching Effectiveness Rating: 5/5
   Course Quality Rating: 4.88/5
3. Introduction to Artificial Intelligence (CS 520, graduate course) **Spring 2020**
   Enrollment: 44 students
   Teaching Effectiveness Rating: 4.7/5
   Course Quality Rating: 4.6/5
4. Introduction to Artificial Intelligence (CS 440, undergraduate course) **Fall 2019**
   Enrollment: 147 students
   Teaching Effectiveness Rating: 4.7/5
   Course Quality Rating: 4.6/5
5. Introduction to Artificial Intelligence (CS 440, undergraduate course) **Spring 2019**
   Enrollment: 152 students
   Teaching Effectiveness Rating: 4.3/5
   Course Quality Rating: 4.4/5
6. Introduction to Artificial Intelligence (CS 440, undergraduate course) **Spring 2018**
   Enrollment: 154 students
   Teaching Effectiveness Rating: 4.5/5
   Course Quality Rating: 4.5/5
7. Robot Learning (CS 674, graduate course) **Fall 2017**
   Enrollment: 14 students
   Teaching Effectiveness Rating: 5/5
   Course Quality Rating: 5/5
8. Introduction to Artificial Intelligence (CS 520, graduate course) **Spring 2017**
   Enrollment: 80 students
   Teaching Effectiveness Rating: 4.4/5
   Course Quality Rating: 4.5/5
9. Introduction to Artificial Intelligence (CS 440, undergraduate course) **Fall 2016**
   Enrollment: 87 students
   Teaching Effectiveness Rating: 2.9/5
   Course Quality Rating: 3.1/5
10. Robot Learning (CS 674, graduate course) **Spring 2016**
    Enrollment: 34 students
    Teaching Effectiveness Rating: 4.2/5
    Course Quality Rating: 4.1/5
11. Introduction to Artificial Intelligence (CS 520, graduate course) **Fall 2015**
    Enrollment: 109 students
    Teaching Effectiveness Rating: 3.8/5
    Course Quality Rating: 4.0/5

Technical University of Darmstadt, Darmstadt, Germany

1. Robot Learning (20-00-0636-se), with Prof. Peters **Summer 2012**
2. Autonomous Learning Systems (20-00-0630-se), with Prof. Peters **Fall 2011, Fall 2012**

Laval University, Québec, Canada

- Teaching Assistant of Probability Theory and Statistics (STT-10400) **Fall 2007**

Paris-Sud University, Orsay, France

- Tutor of Disabled Students **2004-2005**

Refereed Journal and Conference Papers

1. Shiyang Lu, Yunfu Deng, **Abdeslam Boularias** and Kostas Bekris. *Self-Supervised Learning of Object Segmentation from Unlabeled RGB-D Videos.* In Proceedings of the 2023 International Conference on Robotics and Automation (**ICRA**), London, UK, 2023.

2. Haonan Chang, Dhruv Metha Ramesh, Shijie Geng, Yuqiu Gan and **Abdeslam Boularias**. *Mono-STAR: Mono-camera Scene-level Tracking and Reconstruction.* In Proceedings of the 2023 International Conference on Robotics and Automation (**ICRA**), London, UK, 2023.

3. Junchi Liang and **Abdeslam Boularias**. *Learning Category-Level Manipulation Tasks from Point Clouds with Dynamic Graph CNNs.* In Proceedings of the 2023 International Conference on Robotics and Automation (**ICRA**), London, UK, 2023.

4. Liam Schramm, Yunfu Deng, Edgar Granados, and **Abdeslam Boularias**. *USHER: Unbiased Sampling for Hindsight Experience Replay.* In Proceedings of Machine Learning Research (**PMLR**). Presented at the Conference on Robot Learning (**CoRL**), Auckland, New Zealand, 2022.

5. Haonan Chang and **Abdeslam Boularias**. *Scene-level Tracking and Reconstruction without Object Priors.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), Kyoto, Japan, 2022.

6. Baichuan Huang, **Abdeslam Boularias** and Jingjin Yu. *Parallel Monte Carlo Tree Search with Batched Rigid-body Simulations for Speeding up Long-horizon Episodic Robot Planning.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), Kyoto, Japan, 2022.

7. Junchi Liang, Bowen Wen, Kostas E. Bekris and **Abdeslam Boularias**. *Learning Sensorimotor Primitives of Sequential Manipulation Tasks from Visual Demonstrations.* In Proceedings of the 2022 International Conference on Robotics and Automation (**ICRA**), Philadelphia, USA, 2022.

8. Edgar Granados, **Abdeslam Boularias**, Kostas E. Bekris, Mridul Aanjaneya. *Model Identification and Control of a Mobile Robot with Omnidirectional Wheels using Differentiable Physics.* In Proceedings of the 2022 International Conference on Robotics and Automation (**ICRA**), Philadelphia, USA, 2022.

9. Liam Schramm and **Abdeslam Boularias**. *Learning-Guided Exploration for Efficient Sampling-Based Motion Planning in High Dimensions.* In Proceedings of the 2022 International Conference on Robotics and Automation (**ICRA**), Philadelphia, USA, 2022.

10. Baichuan Huang, Teng Guo, **Abdeslam Boularias** and Jingjin Yu. *Self-Supervised Monte Carlo Tree Search Learning for Object Retrieval in Clutter*. In Proceedings of the 2022 International Conference on Robotics and Automation (**ICRA**), Philadelphia, USA, 2022.

11. Baichuan Huang, Shuai D. Han, Jingjin Yu and **Abdeslam Boularias**. *Visual Foresight Tree for Object Retrieval from Clutter with Nonprehensile Rearrangement*. In IEEE Robotics and Automation Letters (**RA-L**), 2021.

12. Shuai D. Han, Baichuan Huang, Changkyu Song, Si Wei Feng, Ming Xu, **Abdeslam Boularias** and Jingjin Yu. *Toward Fully Automated Metal Recycling using Computer Vision and Non-Prehensile Manipulation*. In Proceedings of the 17th IEEE International Conference on Automation Science and Engineering (**CASE**), Lyon, France, 2021.

13. Andrew S Morgan, Bowen Wen, Junchi Liang, **Abdeslam Boularias**, Aaron Dollar and Kostas Bekris. *Vision-driven Compliant Manipulation for Reliable, High-Precision Assembly Tasks*. In Proceedings of Robotics: Science and Systems (**R:SS**), virtual, 2021.

14. Junchi Liang and **Abdeslam Boularias**. *Inferring Time-delayed Causal Relations in POMDPs from the Principle of Independence of Cause and Mechanism*. In Proceedings of the 30th International Joint Conference on Artificial Intelligence (**IJCAI**), Montreal, Canada, 2021.

15. Junchi Liang and **Abdeslam Boularias**. *Self-Supervised Learning of Long-Horizon Manipulation Tasks with Finite-State Task Machines*. In Proceedings of Machine Learning Research (**PMLR**). Presented at the Learning for Dynamics and Control Conference (**L4DC**), ETH Zurich, Switzerland, 2021.

16. Juntao Tan, Changkyu Song and **Abdeslam Boularias**. *A Self-Supervised Learning System for Object Detection in Videos Using Random Walks on Graphs*. In Proceedings of the 2021 International Conference on Robotics and Automation (**ICRA**), Xi'an, China, 2021.

17. Baichuan Huang, Shuai D. Han, **Abdeslam Boularias** and Jingjin Yu. *DIPN: Deep Interaction Prediction Network with Application to Clutter Removal*. In Proceedings of the 2021 International Conference on Robotics and Automation (**ICRA**), Xi'an, China, 2021.

18. Junchi Liang and **Abdeslam Boularias**. *Learning Transition Models with Time-delayed Causal Relations.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), 2020.

19. Changkyu Song and **Abdeslam Boularias**. *A Probabilistic Model for Planar Sliding of Objects with Unknown Material Properties: Identification and Robust Planning.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), 2020.

20. Chaitanya Mitash, Shome Rahul, Bowen Wen, **Abdeslam Boularias** and Kostas Bekris. *Task-driven Perception and Manipulation for Constrained Placement with No Shape Priors*. In IEEE Robotics and Automation Letters (**IEEE RA-L**), and the IEEE International Conference on Intelligent Robots and Systems (**IROS**), 2020.

21. Changkyu Song and **Abdeslam Boularias**. *Learning to Slide Unknown Objects with Differentiable Physics Simulations*. In Proceedings of Robotics: Science and Systems (**R:SS**),

Corvallis, Oregon, 2020.

22. Changkyu Song and **Abdeslam Boularias**. *Identifying Mechanical Models of Unknown Objects with Differentiable Physics Simulations.* In Proceedings of Machine Learning Research (**PMLR**). Presented at the Learning for Dynamics and Control Conference (**L4DC**), Berkeley, California, 2020

23. Avishai Sintov, Andrew Kimmel, Bowen Wen, **Abdeslam Boularias** and Kostas Bekris. *Tools for Data-driven Modeling of Within-Hand Manipulation with Underactuated Adaptive Hands.* In Proceedings of Machine Learning Research (**PMLR**). Presented at the Learning for Dynamics and Control Conference (**L4DC**), Berkeley, California, 2020

24. Liam Schramm, Avishai Sintov and **Abdeslam Boularias**. *Learning to Transfer Dynamic Models of Underactuated Soft Robotic Hands.* In Proceedings of the 2020 International Conference on Robotics and Automation (**ICRA**), Paris, France, 2020.

25. Avishai Sintov, Andrew Kimmel, Kostas Bekris and **Abdeslam Boularias**. *Motion Planning with Competency-Aware Transition Models for Underactuated Adaptive Hands.* In Proceedings of the International Conference on Robotics and Automation (**ICRA**), Paris, France, 2020.

26. Chaitanya Mitash, Bowen Wen, Kostas Bekris and **Abdeslam Boularias**. *Scene-level Pose Estimation for Multiple Instances of Densely Packed Objects.* In Proceedings of Machine Learning Research (**PMLR**). Presented at the Conference on Robot Learning (**CoRL**), Osaka, Japan, 2019.

27. Changkyu Song and **Abdeslam Boularias**. *Object Rearrangement with Nested Nonprehensile Manipulation Actions.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), Macau, China, 2019.

28. Andrew Kimmel, Avishai Sintov, Juntao Tan, Bowen Wen, **Abdeslam Boularias** and Kostas Bekris. *Belief-Space Planning using Learned Models with Application to Underactuated Hands.* In Proceedings of the International Symposium on Robotics Research (**ISRR**), Hanoi, Vietnam, 2019.

29. Chaitanya Mitash, **Abdeslam Boularias** and Kostas Bekris. *Physics-based Scene-level Reasoning for Object Pose Estimation in Clutter.* In the International Journal of Robotics Research (**IJRR**), May 2019.

30. Rahul Shome, Wei Tang, Changkyu Song, Chaitanya Mitash, Chris Kourtev, Jingjin Yu, **Abdeslam Boularias** and Kostas Bekris. *Towards Robust Product Packing with a Minimalistic End-Effector.* In Proceedings of the International Conference on Robotics and Automation (**ICRA**), Montreal, Canada, 2019. **Nominated for Best Paper Award** in Automation.

31. Jean-Philippe Mercier, Chaitanya Mitash, Philippe Giguere, and **Abdeslam Boularias**. *Learning Object Localization and 6D Pose Estimation from Simulation and Weakly Labeled Real Images.* In Proceedings of the International Conference on Robotics and Automation (**ICRA**), Montreal, Canada, 2019.

32. Avishai Sintov, Andrew Morgan, Andrew Kimmel, Aaron Dollar, Kostas Bekris, and **Abdeslam Boularias**. *Learning a State Transition Model of an Underactuated Adaptive Hand.*

In IEEE Robotics and Automation Letters (**RA-L 2019**), Vol. 4, No. 2 , and presented at the International Conference on Robotics and Automation (**ICRA**), Montreal, Canada, 2019.

33. Changkyu Song and **Abdeslam Boularias**. *Inferring 3D Shapes of Unknown Rigid Objects in Clutter through Inverse Physics Reasoning.* In IEEE Robotics and Automation Letters (**RA-L 2019**), Vol. 4, No. 2 , and presented at the International Conference on Robotics and Automation (**ICRA**), Montreal, Canada, 2019.

34. Chaitanya Mitash, **Abdeslam Boularias** and Kostas Bekris. *Robust 6D Object Pose Estimation with Stochastic Congruent Sets.* In Proceedings of The British Machine Vision Conference (**BMVC**), Newcastle, UK, 2018.

35. Shaojun Zhu, David Surovik, Kostas Bekris, **Abdeslam Boularias**. *Efficient Model Identification for Tensegrity Locomotion.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), Madrid, Spain, 2018

36. Shaojun Zhu, Andrew Kimmel, Kostas Bekris and **Abdeslam Boularias**. *Fast Model Identification via Physics Engines for Improved Policy Search.* In Proceedings of the 27th International Joint Conference on Artificial Intelligence (**IJCAI**), Stockholm, Sweden, 2018

37. Chaitanya Mitash, **Abdeslam Boularias** and Kostas Bekris. *Improving 6D Pose Estimation of Objects in Clutter via Physics-aware Monte Carlo Tree Search.* In Proceedings of the IEEE International Conference on Robotics and Automation (**ICRA**), Brisbane, Australia, 2018

38. Chaitanya Mitash, Kostas Bekris and **Abdeslam Boularias**. *A Self-supervised Learning System for Object Detection using Physics Simulation and Multi-view Pose Estimation.* In Proceedings of the IEEE International Conference on Intelligent Robots and Systems (**IROS**), Vancouver, Canada, 2017.

39. Zhikun Wang, **Abdeslam Boularias**, Katharina Mülling, Bernhard Schölkopf and Jan Peters. *Anticipatory Action Selection for Human-Robot Table Tennis.* In **Artificial Intelligence**, Volume 247, Pages 399-414, June 2017.

40. **Abdeslam Boularias**, Felix Duvallet, Jean Oh and Anthony Stentz. *Learning Qualitative Spatial Relations for Robotic Navigation.* In Proceedings of the 25th International Joint Conference on Artificial Intelligence (**IJCAI**), New York, USA, 2016.

41. Jean Oh, Thomas Howard, Matthew Walter, Daniel Barber, Menglong Zhu, Sangdon Park, Arne Suppe, Luis Navarro-Serment, Felix Duvallet, **Abdeslam Boularias**, Oscar Romero, Jerry Vinokrov, Terence Keegan, Robert Dean, Craig Lennon, Barry Bodt, Marshal Childers, Jianbo Shi, Kostas Daniilidis, Nicholas Roy, Christian Lebiere, Martial Hebert and Anthony Stentz. *Integrated Intelligence for Human-Robot Teams.* In Proceedings of The International Symposium on Experimental Robotics (**ISER**), 2016.

42. Samory Kpotufe, **Abdeslam Boularias**, Thomas Schultz, and Kyoungok Kim. *Gradient Weights Improve Regression and Classification.* In the Journal of Machine Learning Research (**JMLR**), 2016.

43. **Abdeslam Boularias**, Felix Duvallet, Jean Oh and Anthony Stentz. *Learning to Ground Spatial Relations for Outdoor Robot Navigation.* In Proceedings of 2015 IEEE International

Conference on Robotics and Automation (**ICRA**), Seattle, USA, 2015.
Best Cognitive Robotics Paper Award (out of 2275 submissions).

44. Jean Oh, Arne Suppe, Felix Duvallet, **Abdeslam Boularias**, Jerry Vinokurov, Luis Navarro-Serment, Oscar Romero, Robert Dean, Christian Lebiere, Martial Hebert and Anthony Stentz. *Toward Mobile Robots Reasoning Like Humans.* In Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (**AAAI**), Austin, Texas, USA, 2015.
Selected for oral presentation

45. **Abdeslam Boularias**, J. Andrew Bagnell and Anthony Stentz. *Learning to Manipulate Unknown Objects in Clutter by Reinforcement.* In Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (**AAAI**), Austin, Texas, USA, 2015.
Selected for oral presentation

46. **Abdeslam Boularias**, J. Andrew Bagnell and Anthony Stentz. *Efficient Optimization for Autonomous Robotic Manipulation of Natural Objects.* In Proceedings of the Twenty-Eighth National Conference on Artificial Intelligence (**AAAI**), Quebec City, Quebec, Canada, 2014.

47. Claudio Persello, **Abdeslam Boularias**, Michele Dalponte, Terje Gobakken, Erik Naesset and Bernhard Schölkopf. *Cost-Sensitive Active Learning With Lookahead: Optimizing Field Surveys for Remote Sensing Data Classification.* In **IEEE Transactions on Geoscience and Remote Sensing** 99: 1-13, 2014.

48. Katharina Mülling, **Abdeslam Boularias**, Betty Mohler, Bernhard Schölkopf and Jan Peters. *Learning Strategies in Table Tennis using Inverse Reinforcement Learning.* In **Biological Cybernetics** 108(5): 603-619 , 2014.

49. **Abdeslam Boularias** and Brahim Chaib-draa. *Apprenticeship Learning with Few Demonstrations.* In **Neurocomputing** 104: 83-96, 2013.

50. **Abdeslam Boularias**, Oliver Krömer and Jan Peters. *Algorithms for Learning Markov Field Policies.* In Advances in Neural Information Processing Systems 26 (**NIPS**), Lake Tahoe, NV, USA, 2012.

51. Samory Kpotufe and **Abdeslam Boularias**. *Gradient Weights help Nonparametric Regressors.* In Advances in Neural Information Processing Systems 26 (**NIPS**), Lake Tahoe, NV, USA, 2012.
Selected for plenary presentation: 1.36% acceptance rate

52. Yu Nishiyama, **Abdeslam Boularias**, Arthur Gretton and Kenji Fukumizu. *Hilbert Space Embeddings of POMDPs.* In Proceedings of the Twenty-Eighth Conference on Uncertainty in Artificial Intelligence (**UAI**), Catalina Island, CA, USA, 2012.

53. **Abdeslam Boularias**, Oliver Krömer and Jan Peters. *Structured Apprenticeship Learning.* In Proceedings of the Twenty-Third European Conference on Machine Learning (**ECML**), Bristol, UK, 2012.

54. **Abdeslam Boularias**, Oliver Krömer and Jan Peters. *Learning Robot Grasping from 3-D Images with Markov Random Fields.* In Proceedings of the IEEE/RSJ International Confer-

ence on Intelligent Robots and Systems (**IROS**), San Francisco, CA, USA, 2011.

55. Zhikun Wang, **Abdeslam Boularias**, Katharina Mülling and Jan Peters. *Balancing Safety and Exploitability in Opponent Modeling.* In Proceedings of the Twenty-Fifth National Conference on Artificial Intelligence (**AAAI**), San Francisco, CA, USA, 2011.

56. **Abdeslam Boularias**, Jens Kober and Jan Peters. *Relative Entropy Inverse Reinforcement Learning.* In Proceedings of the International Conference on Artificial Intelligence and Statistics (**AISTATS**), Fort Lauderdale, FL, USA, 2011. Volume 15 of JMLR.

57. **Abdeslam Boularias** and Brahim Chaib-draa. *Bootstrapping Apprenticeship Learning.* In Advances in Neural Information Processing Systems 24 (**NIPS**), Vancouver, Canada, 2010.

58. **Abdeslam Boularias** and Brahim Chaib-draa. *Apprenticeship Learning via Soft Local Homomorphisms.* In Proceedings of 2010 IEEE International Conference on Robotics and Automation (**ICRA**), Anchorage, USA, 2010.

59. **Abdeslam Boularias** and Brahim Chaib-draa. *Predictive Representations for Policy Gradient in POMDPs.* In Proceedings of the International Conference on Machine Learning (**ICML**), Montreal, Canada, 2009.

60. **Abdeslam Boularias** and Brahim Chaib-draa. *Exact Dynamic Programming for Decentralized POMDPs with Lossless Policy Compression.* In Proceedings of the International Conference on Automated Planning and Scheduling (**ICAPS**), Sydney, Australia, 2008.

61. **Abdeslam Boularias**. *A Predictive Model for Imitation Learning in Partially Observable Environments.* In Proceedings of the International Conference on Machine Learning and Applications (ICMLA), San Diego, CA, USA, 2008.

62. **Abdeslam Boularias**, Masoumeh Izadi and Brahim Chaib-draa. *Prediction-directed Compression of POMDPs.* In Proceedings of the International Conference on Machine Learning and Applications (ICMLA), San Diego, CA, USA, 2008.

63. **Abdeslam Boularias**, Masoumeh Izadi and Brahim Chaib-draa. *State Space Compression with Predictive Representations.* In Proceedings of 21st International FLAIRS Conference, Coconut Grove, FL, USA, 2008.

64. Andriy Burkov, **Abdeslam Boularias** and Brahim Chaib-draa (2007). *Competition and Coordination in Stochastic Games.* In Proceedings of the 20th Canadian Conference on Artificial Intelligence, Montréal, Canada, 2007.

Refereed Workshop Papers

1. Chaitanya Mitash, Bowen Wen, Kostas Bekris, and **Abdeslam Boularias**. Scene-level Pose Estimation for Multiple Instances of Densely Packed Objects. In the RSS Pioneers Workshop, Robotics: Science and Systems (RSS), Freiburg, Germany, 2019.

2. Avishai Sintov, Andrew Kimmel, **Abdeslam Boularias** and Kostas Bekris. Data-based Within-hand Manipulation of an Underactuated Adaptive Hand. In the ICRA 2019 Workshop on Benchmarks for Robotic Manipulation.

3. Rahul Shome, Wei N. Tang, Chaitanya Mitash, **Abdeslam Boularias**, Jingjin Yu, and Kostas Bekris. An Efficient Pipeline for Pick-and-Place Between Bins for Warehouse Automation. In the IROS 2018 Workshop on Robotics for logistics in warehouses and environments shared with humans.

4. Jean-Philippe Mercier, Chaitanya Mitash, Philippe Gigure and **Abdeslam Boularias**. Learning Object Localization and 6D Pose Estimation from Simulation and Weakly Labeled Real Images. In the 4th International Workshop on Recovering 6D Object Pose. ECCV 2018.

5. Jean-Philippe Mercier, Chaitanya Mitash, Philippe Giguere and **Abdeslam Boularias**. Learning Object Localization and 6D Pose Estimation from Simulation and Weakly Labeled Real Images. In the Montreal AI Symposium 2018.

6. Chaitanya Mitash, **Abdeslam Boularias** and Kostas Bekris. Robust 6D Object Pose Estimation with Stochastic Congruent Sets. In the 4th International Workshop on Recovering 6D Object Pose. ECCV 2018.

7. Shaojun Zhu, David Surovik, Kostas Bekris and **Abdeslam Boularias**. Information-Efficient Model Identification for Tensegrity Robot Locomotion. In AAAI 2018 Spring Symposium on Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy.

8. Chaitanya Mitash, **Abdeslam Boularias** and Kostas Bekris. Object Detection and Pose Estimation for Robotic Manipulation using Physics Simulation and Monte Carlo Tree Search. In Northeast Robotics Colloquium (NERC), Boston, 2017

9. Chaitanya Mitash, Kostas Bekris and **Abdeslam Boularias**. Physics-aware Simulation and a Self-Supervised Learning System for Object Detection and Pose Estimation. In ICRA'17 Workshop on Warehouse Picking Automation.

10. Shaojun Zhu and **Abdeslam Boularias**. A Physically-Grounded and Data-Efficient Approach to Motion Prediction Using Black-Box Optimization. In NIPS'16 Workshop on Intuitive Physics and NIPS'16 Workshop on Bayesian Optimization.

11. Katharina Mülling, **Abdeslam Boularias**, Betty Mohler, Bernhard Schölkopf and Jan Peters. Inverse Reinforcement Learning for Strategy Extraction. In Proceedings of ECML'13 Workshop on Machine Learning and Data Mining for Sports Analytics.

12. **Abdeslam Boularias**, Oliver Krömer and Jan Peters. *Structured Apprenticeship Learning.* In Proceedings of the 10th European Workshop on Reinforcement Learning (EWRL'12), 2012.

13. Yu Nishiyama, **Abdeslam Boularias**, Arthur Gretton and Kenji Fukumizu. *Kernel Bellman Equations in POMDPs.* In Proceedings of the Technical Committee on Information-Based Induction Sciences and Machine Learning (IBISML 2012), Tokyo, Japan, 2012.

14. **Abdeslam Boularias**, Hamid R. Chinaei and Brahim Chaib-draa. *Learning the Reward Model of Dialogue POMDPs.* In NIPS'10 Workshop on Machine Learning for Assistive Technology (MLAT-2010), Vancouver, Canada, 2010.

15. **Abdeslam Boularias** and Brahim Chaib-draa. *Policy Transfer in Apprenticeship Learning.* In NIPS'09 Workshop on Transfer Learning for Structured Data, Vancouver, Canada, 2009.

16. **Abdeslam Boularias** and Brahim Chaib-draa. *Learning Probabilistic Models via Bayesian Inverse Planning.* In NIPS'09 Workshop on Probabilistic Approaches for Robotics and Control, Vancouver, Canada, 2009.

17. **Abdeslam Boularias** and Brahim Chaib-draa. *Planning in Decentralized POMDPs with Predictive Policy Representations.* In Proceedings of ICAPS'08 Multi-agent Planning Workshop (MASPLAN'08), Sydney, Australia, 2008.

18. **Abdeslam Boularias** and Brahim Chaib-draa. *Les Représentations Prédictives des États et des Politiques.* In Actes des Quatrièmes Journées Francophones Modèles Formels de l'Intéraction (MFI'07), Paris, France, 2007.

THESES

1. **Abdeslam Boularias**. *Predictive Representations For Sequential Decision Making Under Uncertainty.* Laval University, Canada, 2010.

2. **Abdeslam Boularias**. *Using Predictive Representations for Planning and Learning in Partially Observable Systems.* Laval University, Canada, 2008.

3. **Abdeslam Boularias**. *Vers une approche alliant les représentations prédictives des états et les options pour la prise de la décision.* Laval University, Canada, 2006.

4. **Abdeslam Boularias**. *MPICH-V3: un MPI tolérant aux défaillances pour les Grilles.* University of Paris-Sud, France, 2005.

5. **Abdeslam Boularias** and Belaid Saad. *Implémentation et étude des performances de la structure Compact Trie Hashing (CTH*).* ESI, Algeria, 2004.

FUNDING

Total: **$4,557,907**.

1. National Science Foundation (NSF): *NRI: Robust and Efficient Physics-Based Learning and Reasoning in Degraded Environments.* PI: Abdeslam Boularias, co-PI: Jingjin Yu, co-PI: Mridul Aanjaneya. Amount: $1,490,276. 2021-2025.

2. National Science Foundation (NSF): *RI: CAREER: Task-Oriented Model Identification for Robust Robotic Manipulation.* Sole PI: Abdeslam Boularias. Amount: $535,896. 2019-2024.

3. National Science Foundation (NSF): *S&AS: FND: Reflective Learning of Stochastic Physical Models for Robust Manipulation.* PI: Abdeslam Boularias, co-PIs: Kostas Bekris and Mubbasir Kapadia. Amount: $682,646. 2017-2020.

4. National Science Foundation (NSF): *NRI: INT: COLLAB: Integrated Modeling and Learning for Robust Grasping and Dexterous Manipulation with Adaptive Hands.* PI: Kostas Bekris, co-PI: Abdeslam Boularias. Amount: $867,729. 2017-2021.

5. GEMChina: *Intelligent and High-Efficiency Recycling of Non-Ferrous Metals Through Computer Vision Driven Robotics.* PI: Jingjin Yu, co-PI: Abdeslam Boularias. Amount: $601,360. 2018-2020.

6. JD.com, Inc: *Configurable Hand for Intelligent Material Picking.* PI: Kostas Bekris, co-PIs: Abdeslam Boularias and Jingjin Yu. Amount: $240,000. 2017-2018.

7. General Dynamics Corporation, Collaborative Technology Alliance Program: *Learning Mechanical and Geometric Models of Unknown Objects Online.* Sole PI: Abdeslam Boularias. Amount: $80,000. 2017-2018.

8. General Dynamics Corporation, Collaborative Technology Alliance Program: *Learning Spatial Relations for Manipulating Unknown Objects.* Sole PI: Abdeslam Boularias. Amount: $60,000. 2016-2017.

Scholarships and Fellowships

Research Fellowship, The Max Planck Society for the Advancement of Science, 2011-2013.
Research Fellowship, The European Union Framework Programs, 2010-2011.
Scholarship of Quebec Ministry of Education, 2006-2008.
Key contributions to a grant of Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT), 2008.

Journal Article Reviewing

IEEE Transactions on Systems, Man, and Cybernetics, 2009 and 2010.
IEEE Transactions on Cybernetics, 2015.
Neurocomputing, 2011.
Robotics and Autonomous Systems, 2012.
Neural Networks, 2013.
Neural Computation, 2013.
Autonomous Robots, 2013, 2019 and 2020.
Journal of Machine Learning Research, 2013, 2016, 2017 and 2020.
IEEE Transactions on Robotics, 2016 and 2017.
IEEE Robotics and Automation Letters, 2016, 2017, 2018, 2019 and 2020.
Robotics and Autonomous Systems, 2017.
Machine Learning, 2017.
International Journal of Robotics Research, 2017
Journal of Field Robotics, 2021.

Program Committee Membership

International Workshop on the Algorithmic Foundations of Robotics (WAFR), 2020.
Annual Conference on Robot Learning (CoRL), 2017 and 2019.
International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2008.
North-East Student Colloquium on Artificial Intelligence (NESCAI), 2008.
International Joint Conference on Artificial Intelligence (IJCAI), 2009.
International Conference on Intelligent Robots and Systems (IROS), 2009, 2010, 2011, 2012, 2016, 2019 and 2020.
International Conference on Humanoid Robots (Humanoids), 2010, 2011, 2013 and 2014.
Snowbird Learning Workshop, 2011 and 2012.
International Conference on Robotics and Automation (ICRA), 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020.
Annual Conference on Neural Information Processing Systems (NIPS), 2011, 2013, 2014, 2015, 2016 and 2017.
International Colloquium on Automata, Languages and Programming (ICALP), 2013.
International Conference on Artificial Intelligence and Statistics (AISTATS), 2017, 2018, 2019 and

2020.
International Conference on Learning Representations (ICLR), 2018, 2019.
Robotics: Science and Systems (R:SS), 2015, 2016, 2019, 2020 and 2021.
International Conference on Artificial Neural Networks (ICANN), 2011.
European Workshop on Reinforcement Learning (EWRL), 2012.
Fall Symposium of the Association for the Advancement of Artificial Intelligence (AAAI), 2012.
IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning (ADPRL), 2013.
International Conference on Machine Learning (ICML), 2012, 2013 and 2018.
European Conference on Machine Learning (ECML PKDD), 2013

Senior Program Committee Membership

Association for the Advancement of Artificial Intelligence (AAAI), 2012.
International Joint Conference on Artificial Intelligence (IJCAI), 2013.

Associate Editor

International Conference on Robotics and Automation (ICRA), 2021, 2022 and 2023.
International Conference on Intelligent Robots and Systems (IROS), 2014, 2015, 2016 and 2017.

Area Chair

Robotics: Science and Systems (R:SS), 2023
International Conference on Machine Learning (ICML), 2021 and 2023
International Conference on Learning Representations (ICLR), 2021 and 2022
International Conference on Artificial Intelligence and Statistics (AISTATS), 2022 and 2023
Annual Conference on Neural Information Processing Systems (NeurIPS), 2018, 2019, 2020, 2022 and 2023.
Uncertainty in Artificial Intelligence (UAI), 2020.
Annual Conference on Robot Learning (CoRL), 2018, 2020 and 2021.

Grant and Fellowship Reviewing

NSF program, Foundational Research in Robotics and CAREER (once).
NSF program, Smart and Autonomous Systems (once).
NSF program, National Robotics Initiative 2.0: Ubiquitous Collaborative Robots (twice).
NSF program, Research Traineeship (NRT) program (once).
European Coordinated Research on Long-term Challenges in Information and Communication Sciences & Technologies (CHIST-ERA), 2017.
The Natural Sciences and Engineering Research Council of Canada (NSERC), 2012 .
AAAI Robotics Fellowships, 2015 and 2016.

Currently Advised Ph.D. Students at Rutgers

1. Liam Schramm. Advising since September 2018.
2. Shuo Zhang. Advising since September 2019.
3. Haonan Chang. Advising since September 2020.
4. Yuhan Liu. Advising since September 2022.
5. Xinyu Zhang. Advising since September 2022.
6. Eric Pu Jing. Advising since September 2022.

Advised Ph.D. Students at Rutgers

Junchi Liand, Ph.D. September 2016 - September 2022. Now a Research Scientist at Meta.
Chaitanya Mitash, Ph.D. March 2016 - July 2020. Now a Research Scientist at Amazon Robotics.
Changkyu Song, Ph.D. September 2017 - April 2021. Now a Research Scientist at Waymo.

Advised Postdoc at Rutgers

Avishai Sintov, May 2018 - September 2019. Now an Assistant Professor at Tel Aviv University.

Supervised M.S. Students at Rutgers

1. Yunfu Deng, 2022. Project: *Contrastive Learning for Semantic Segmentation.*
2. Juntao Tan, 2019. Project: *Transfer Learning of Dynamics Models.*
3. Aravind Sivaramakrishnan, 2018. Project: *Apprenticeship Learning of Sequential Manipulation Tasks.*
4. Shaojun Zhu (co-advised), 2017. Project: *Closing the Reality Gap of Robotic Simulators through Task-oriented Bayesian Optimization.*
5. Yikun Xian, 2016. Project: *Model-based Deep RL for Playing Atari Games.*

Supervised Undergraduate Interns at Rutgers

1. Lance Luo, Summer 2019. Project: *Design and Implementation of a Neural Network for Learning the Dynamics of a Robotic Hand.*
2. Yuxuan Wu, Summer 2019. Project: *Deep RL for Grasping Objects in Dense Clutter.*
3. Ruipeng Zhang, Summer 2019. Project: *Deep RL for Grasping Objects in Dense Clutter.*

Co-advised Students

1. Katharina Mülling, Ph.D., Max Planck Institute for Intelligent Systems. Now at Google X.
2. Zhikun Wang, Ph.D., Max Planck Institute for Intelligent Systems. Now at Google.
3. Jean-Philippe Mercier, Ph.D., Laval University.
4. Brahim El Moumni, M.S., Laval University.
5. Allain Sulface, M.S., Laval University.

Ph.D. and M.S. Thesis Committees

Kun Wang, Ph.D., Rutgers University, 2022.
Shahrzad Ziaee, Ph.D., Rutgers University, 2022.
Bowen Wen, Ph.D., Rutgers University, 2022.
Guangzhi Tang, Ph.D., Rutgers University, 2022.
Shuai D. Han, Ph.D., Rutgers University, 2021.
Mohamed Abdellatif, Ph.D., Rutgers University, 2021.
Rahul Shome, Ph.D., Rutgers University, 2020.
Alireza Naghizadeh, Ph.D., Rutgers University, 2020.
Yikai Zhang, Ph.D., Rutgers University, 2020.
Tugba Kulahcioglu, Ph.D., Rutgers University, 2020.
Hristiyan (Chris) Kourtev, M.S., Rutgers University, 2018.
Zacharias Psarakis, M.S., Rutgers University, 2018.
Yang Yu, M.S., Rutgers University, 2017.
Pritish Sahu, M.S., Rutgers University, 2017.
Aditya Chukka, M.S., Rutgers University, 2017.
Colin Rennie, M.S., Rutgers University, 2017.
Behnam Babagholami, Ph.D., Rutgers University, 2019.
Jean-Philippe Mercier, Ph.D., Laval University, 2021.
Rahul Shome, Ph.D., Rutgers University, 2020.
Zachary Littlefield, Ph.D., Rutgers University, 2020.
Mohamed El Hosseiny, Ph.D., Rutgers University, 2016.
Tarek El-Gaaly, Ph.D., Rutgers University, 2015.

Ph.D. Qualifying Committees

Shiyang Liu (2022), Hailun Ding (2022), Haonan Chang (2022), Teng Guo (2022), Baichuan Huang (2022), Mihee Lee (2020), Liam Schramm (2020), Junchi Liang (2020), Baber Khalid (2020), Yanshi Luo (2020), Han Shuai (2019), Guang Wang (2019), Wei Tang (2019), Chaitanya Mitash (2019), Changkyu Song (2019), Mohammadreza Soltaniyeh (2019), Mohamed Abdellatif (2019), Zhiqiang Tang (2018), Mahyar Khayatkhoei (2018), Behnam Gholami (2018), Rahul Shome (2018), Cong Zhang (2017), Mengsong Zou (2016), Jie Schen (2016).

Department service

Rutgers DCS Website Committee, Rutgers University, 2019-2020.
M.S. Admissions Committee, Rutgers University, 2015, 2016, 2017, 2018 and 2019.
Faculty Search Committee, Rutgers University, 2016, 2018, 2019 and 2023.
Co-organizer of weekly seminars at CBIM, Rutgers University, 2016 and 2017.
Organizer of weekly seminars at the computer science department of Laval University, 2008.

Invited Talks

McGill University (Canada, 2007 and 2009), Max Planck Institute for Intelligent Systems (Germany, 2010), Alberta Ingenuity Centre for Machine Learning (Canada, 2010), Technical University of Darmstadt (Germany, 2011), INRIA SequeL (France, 2011), IBM Dublin (Ireland, 2013), University of Ottawa (Canada, 2013), Laval University (Canada 2015), Tufts University (US, 2015), University of Utah (US, 2015), Rutgers University (US, 2015), Stevens Institute (US, 2015), Arizona State University (US, 2015), University of British Columbia (Canada, 2015), Laval University (Canada 2020), University of Alberta (Canada, 2020), Karlsruhe Institute of Technology (Germany, 2020), Technical University of Darmstadt (Germany, 2020).

Software Releases

- Faculty mentor of the ModelMatching too for 6D object pose estimation with stochastic congruent sets. The tool is publicly available at `https://github.com/cmitash/model_matching`.
- Faculty mentor of the multi-instance-pose-estimation tool for multi-instance 6D object pose estimation. The tool is publicly available at `https://github.com/cmitash/multi-instance-pose-estimation`.
- Faculty mentor of the PoseSelection tool to render a set of pose hypotheses for an object and compare it to a depth image. The tool is publicly available at `https://github.com/cmitash/pose_selection`.
- Faculty mentor of the physim-dataset-generator tool to generate physically realistic synthetic datasets of cluttered scenes using 3D CAD models to train CNN-based object detectors. The tool is publicly available at `https://github.com/cmitash/physim-dataset-generator`.
- Faculty mentor of the Label6DPose tool to label 6d pose of objects in images by manually aligning object models to the point-cloud obtained from depth and color image. The tool is publicly available at `https://github.com/cmitash/Label6DPose`.
- Faculty mentor of the PhysimGlobalPose tool, a C++ implementation for search based 6d pose estimation of objects in clutter. The tool is publicly available at `https://github.com/cmitash/PhysimGlobalPose`.
- Faculty mentor of the CalibrateViewsPCL tool for calibrating multiple views for merging point cloud. The tool is publicly available at `https://github.com/cmitash/CalibrateViewsPCL`.
- Faculty mentor of the t42AutonomousSystem tool kit for learning the dynamics of an underactuated hand. The tool is publicly available at `https://github.com/avishais/t42_autonomous_system`.
- Faculty mentor of the gazebo-adaptive-hand-simulator tool for simulating an adaptive hand. The tool is publicly available at `https://github.com/avishais/gazebo_adaptive_hand_simulator`.
- Faculty mentor of the Rutgers Underactuated-hand Manipulation (RUM) dataset. Webpage and source code are publicly available at `https://github.com/avishais/underactuated_hand_tools`.
- Faculty mentor of the IPR dataset for interactive volumetric shape completion. Webpage and source code are publicly available at `https://sites.google.com/site/changkyusong86/research/iros2018?authuser=0`.

Organization

- Co-organizer (with Francesco Dinuzzo) of the workshop: Machine Learning for System Identification at ICML 2013. `http://mlsysid.tuebingen.mpg.de/`
- Co-organizer (with Brian Ziebart) of the workshop: New Developments in Imitation Learning at ICML 2011. `https://www.ias.informatik.tu-darmstadt.de/Research/ICML2011`
- Co-organizer (with Kostas Bekris and Jingjin Yu) of the VIIth Northeast Robotics Colloquium (NERC VII), 2018. `http://northeastrobotics.org/`
- Co-organizer (with Ahmed Guessoum and Djalel Benbouzid) of the First Machine Learning Summer School (MLSS) in Algiers, Algeria, 2018. `https://mlschool.org/algiers2018/`
- Co-organizer (with Mridul Aanjaneya) of the TRIPODS Data Science Boot Camp: Matching Robot Simulations to Reality. Rutgers University, 2021. `http://robotics.cs.rutgers.edu/data-inspire/boot-camp/`

Computer Skills

C++, Matlab, CPLEX, MPI (Message Passing Interface), Parallel Computing, PCL (Point Cloud Library), Eigen, OpenCV, ROS (Robot Operating System)

References

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3480, rue de l'Université
H3A 2A7 Montréal, Canada
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