Todor Davchev

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Education

2020 CDT in Robotics and Autnomous Systems, The University of Edinburgh
2016 MSc in Machine Learning, The University of Edinburgh
2014 BSc in Artificial Intelligence, The University of Aberdeen

Scholarships & awards

May 2019 Google AI Residency at X
Jul. 2017 DeepLearn 2017 Summer School, Certificate of Completion.
Sept. 2016 iCASE Award, University of Edinburgh.
Sept. 2015 The Informatics UK/EU Master's Scholarship.
Sept. 2015 University of Edinburgh Postgraduate Bursary.
June. 2014 International Knowledge Measurement (IKM) test. Scored 98.% better than everyone since 1987.
May 2013 The Chartered Institute for IT Prize for Best Robot Team.

Talks & Projects

2020a **T. Davchev**, K. Luck, M. Burke, F. Meier, S. Schaal, S. Ramamoorthy, Residual Learning from Demonstration **under review**;
2020b N. Das, S. Bechtle, **T. Davchev**, D. Jayaraman, A. Rai, F. Meier, Model-Based Inverse Reinforcement Learning from Visual Demonstrations **under review**;
2020c **T. Davchev**, M. Burke, S. Ramamoorthy, Learning Structured Representations of Spatial and Interactive Dynamics for Trajectory Prediction in Crowded Scenes **under review**
2019a M. Asenov, M. Burke, D. Angelov, **T. Davchev**, S. Ramamoorthy Vid2param Online System Identification from Video for Robotics Applications, **ICRA 2020**, Paris;
2019b **T. Davchev**, T. Korres, S. Fotiadis, N. Antonopoulos, and S. Ramamoorthy, An Empirical Evaluation of Preservation of Robustness under Transfer Learning, **ICML 2019** Workshop on Understanding and Improving Generalization in Deep Learning, Long Beach, [code];
2019c **T. Davchev**, M. Burke, and S. Ramamoorthy, Learning spatial representations and global dynamics for structured long term motion prediction;
2019d **T. Davchev**, Model-based Predictions for Model-based Planning, **PCC 2019, invited talk**, Processing, Computing and Cognition PhD day at Thales, Paris;
2017a **T. Davchev**, "An Options Framework for Hierarchical Inverse Reinforcement Learning", [code];
2016 **T. Davchev**, and M. Lapata, "Modelling Entailment with Neural Networks" Improved the state-of-the-art on entailment modelling using a CNN-based architecture, **MSc Thesis**, [code];
2014a **T. Davchev**, and N.Oren, "Opponent Modelling for Strategic Argumentation" Built a framework for argumentation using α-β pruning, **BSc Thesis**, [code];
2014b **T. Davchev**, and T. J. Norman, "Evaluating RL for Dynamic Taxi Pricing" Showed how to improve taxi drivers' profit in small towns using probabilistic models for exploration, **side project**, [code].

Work Experience

4 Months, 2019 — Google, The team at X
AI Resident
- Built a library for teleoperation using in-house hardware;
- Evaluated performance of LfD on a set of insertion tasks;
- Built a residual learning framework that learns on-robot RL policies directly using TF-Agents.

2 Years, 2017 — Machine Learning Practical, University of Edinburgh
Tutor, Demonstrator, Course Marker
- Supervised 10 groups of MSc students who conduct publishable research on various topics in Deep Learning.
- Published the best paper with supervisees on a workshop at ICML 2019 [link].
- Contributed to explaining and implementing core concepts in deep learning.

6 Months, 2018 — Algorithms, Data Structures, Learning, University of Edinburgh
Tutor
- Tutored 15 Undergraduate students on key symbolic and numerical technicalities regarding algorithms, data structures, probability, algebra and machine learning.

8 Months, 2018 — Informatics Research Review, University of Edinburgh
TA and Course Marker
- Tutored 12 people on best practices to conduct current research in Machine Learning.

1 Month, 2017 — The Alan Turing Institute, London
Visiting Data Scientist
- Improved health-care using fast topic model implemented in Python for finding and visualising research for clinical decision making.

6 Months, 2016 — RSpace, Edinburgh
Software Developer (test automation)
- Used Java and Selenium to automate the designed tests for a small start-up comprised of 10 people.

1 Year, 2014 — Broadridge Financial Solutions, Edinburgh
Graduate Developer
- Contributed to a wide variety of projects by building, maintaining, testing and deploying software solutions for a large-scale system.
- Proejcts include building a SWIFT message parser in Java, used both internally and by clients, improving and expanding the Server side system;
- Gained experience in using Spring Beans. Built a number of reporting procedures in PL/SQL;
- Praised in a written form by major company clients. Created scripts for Unix and Windows environments. Wrote technical specifications.

3 Months 2013 — Mikamai S.A.R.L., Milan
Developer, Summer Intern
- Used an agile approach as well as Pomadoro techniques for development in a small team using the MVC pattern.
- Participated in the creation of an Arduino system for the foosball at the office.

Technical Skills and Open-Source Contributions

Python — Used for all projects and teaching from the past 3 years;
Tensorflow — Used substantially throughout the course of PhD;
C/C++ — Used for the most recent project from 2019;
OpenAI GYM — Used among others such as MuJoCo and Tf-Agents throughout the PhD;
Contribution — Framework for Stochastic Trajectory Prediction [code];
Contribution — The option-critic framework for hierarchical RL implemented in Tensorflow [code];
Contribution — OpenAI RoboSchool [GitHub];
Fixed OpenGL initialisation issue.
Contribution — Machine Learning Practical course [GitHub];
Added clarifications, proofread, contributed to the installation and cluster set up.
Contribution — DAGAN: Data Augmentation Generative Adversarial Networks [GitHub].

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