Elena Corina Grigore

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Research Interests

Robotics, autonomous driving, machine learning, deep learning, artificial intelligence, adaptive systems.

Work Experience

- **Senior Research Scientist at Motional, Boston, MA, USA**   September, 2020 – present
  Research Scientist at Motional, Boston, MA, USA   October, 2018 – September, 2020
  Prediction and Behavior Modeling team

  Working on the Prediction and Behavior Modeling team, applying machine learning techniques (notably, deep learning) to model and predict the trajectories and intentions of all the agents of interest in the environment of a self-driving vehicle [7], [6].

  Outcome: Utilizing and expanding my research skills to develop models of how agents behave on the road, and to publish state-of-the-art solutions to top machine learning conferences. Applying large-scale deep learning models to real-world, large datasets involving temporal data. Utilizing my knowledge of Python and PyTorch, being part of the full process of creating and deploying deep learning models. Working in a dynamic and fast-paced team with strong collaboration practices, as well as working with other teams to understand data constraints and establish interfacing between modules.

- **Research Intern at Uber Advanced Technologies Group**   June, 2017 – August, 2017
  San Francisco, CA, USA
  Deep learning for self-driving car perception team

  Worked on the perception module of the self-driving pipeline, where the aim was to detect all targets of interest in the environment of the autonomous vehicle. Researched introducing temporal context into deep learning networks, including the use of multi-frames and recurrent neural networks.

  Outcome: Gained experience using large scale deep learning models for detection, and developed research skills relevant to working with region-based convolutional neural networks and recurrent neural networks. Gained experience using the Google Object Detection codebase, TensorFlow, and its associated utilities for working with large datasets (e.g., TFRecords). Worked in a fast-paced team, and collaborated with colleagues to implement novel ideas for the team's deep learning models.

Education

- **Doctor of Philosophy, Computer Science, Yale University, USA**   2018
  Advisor: Brian Scassellati
  Ph.D. Thesis: Learning Supportive Behaviors for Adaptive Robots
  in Human-Robot Collaboration
  Available at: `https://scazlab.yale.edu/sites/default/files/files/corina_dissertation.pdf`

  Applying machine learning techniques to endow robots with learning capabilities needed when placed in new environments or faced with new tasks. This includes learning about the structure and progression of a physical task, as well as about the actions human workers perform during this task. Investigating techniques including Hidden Markov Models and reinforcement learning in single- and multi-agent settings, where the robot's aim is to provide supportive behaviors in human-robot collaboration scenarios [5], [4], [3].

- **Master of Philosophy, Computer Science, Yale University, USA**   2015

- **Master of Science, Computer Science, Yale University, USA**   2015

- **Master of Engineering with Study Abroad**
  Computer Science, University of Bristol, UK 2012
  Advisors: Kerstin Eder (University of Bristol, UK)
      Anthony G. Pipe (Bristol Robotics Laboratory, UK)
      Christopher Melhuish (Bristol Robotics Laboratory, UK)
  Master's Thesis: *"I Robot, I Think"*
  Applied machine learning techniques to model users' intentions for object handovers in human- robot interaction scenarios [1].

  4-year program encompassing my Bachelor's degree
  Study Abroad at University of California, San Diego (2010/2011)
  Master of Engineering with First Class Honors

Selected Publications

[7] T. Phan-Minh, **E. C. Grigore**, F. A. Boulton, O. Beijbom, and E. M. Wolff, "Covernet: Multimodal behavior prediction using trajectory sets", in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Virtual, 2020, June 1419, pp. 14 074–14 083.

[6] F. A. Boulton, **E. C. Grigore**, and E. M. Wolff, "Motion prediction using trajectory sets and self-driving domain knowledge", Available at: arXiv preprint arXiv:2006.04767, 2020.

[5] **E. C. Grigore**, A. Roncone, O. Mangin, and B. Scassellati, "Preference-based assistance prediction for human-robot collaboration tasks", in *Proceedings of the 31st IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, Spain, 2018, October 1–5.

[4] **E. C. Grigore** and B. Scassellati, "Discovering action primitive granularity from human motion for human-robot collaboration", in *Robotics: Science and Systems (RSS)*, Boston, USA, 2017, July 12–16.

[3] **E. C. Grigore** and B. Scassellati, "Hierarchical multi-agent reinforcement learning through communicative actions for human-robot collaboration", in *Proceedings of the Future of Interactive Learning Machines (FILM) Workshop at the 30th Annual Conference on Neural Information Processing Systems (NeurIPS)*, Full paper, Barcelona, Spain, 2016, December 5–10.

[2] E. Short, K. Swift-Spong, J. Greczek, A. Ramachandran, A. Litoiu, **E. C. Grigore**, D. Feil-Seifer, S. Shuster, J. J. Lee, S. Huang, *et al.*, "How to train your dragonbot: socially assistive robots for teaching children about nutrition through play", in *Proceedings of the 23rd IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, IEEE, 2014, August 25–29, pp. 924–929.

[1] **E. C. Grigore**, K. Eder, A. G. Pipe, C. Melhuish, and U. Leonards, "Joint action understanding improves robot-to-human object handover", in *Proceedings of the 26th IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2013, November 3–7, pp. 4622–4629.

Honors and Awards

- **Best Paper Finalist, Intelligent Virtual Agents (IVA)** 2016
  "Verbal Communication Improves Perceptions of Friendship and Social Presence
  in Human-Robot Interaction"

- **Best Student Paper Finalist, International Conference on Social Robotics (ICSR)** 2016
  "Comparing Ways to Trigger Migration between a Robot and a Virtually Embodied Character"

- **Human-Robot Interaction (HRI) Pioneer** 2016
  Highly selective workshop that seeks to foster creativity and collaboration across HRI

- **Tocher Fellowship, Yale University, USA** 2014 – 2015

- **Engineering and Physical Sciences Research Council Fellowship, UK** 2010, 2011
  Summer Research Projects at the Bristol Robotics Lab, Bristol, UK

- **Head of Promotion Honorary Prize (Valedictorian),**
  Piatra Neamț Computer Science High School, Romania 2008