Otilia Stretcu

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Languages: Romanian (native), English (fluent), Spanish (beginner), German (beginner), Swedish (beginner)

RESEARCH AREAS

My research focuses on developing algorithms for machine learning, mainly focused on curriculum learning, semi-supervised learning, multitask learning, and graph-based problems. I am also passionate about applying machine learning methods in neuroscience, in order to study how the brain understands language and represents knowledge.

EDUCATION

2015 - 2021 **Carnegie Mellon University – Ph.D. in Machine Learning** USA

- Co-advised by **Prof. Barnabàs Pòczos** and **Prof. Tom Mitchell**
- GPA: 4.0 (4.0 scale)
- Thesis topic: *Curriculum Learning*
- Thesis committee: Tom Mitchell, Barnabàs Pòczos, Ruslan Salakhutdinov, Rich Caruana

2015 - 2017 **Carnegie Mellon University – M.S. in Machine Learning** USA

- Co-advised by **Prof. Barnabàs Pòczos** and **Prof. Tom Mitchell**
- GPA: 4.0 (4.0 scale)
- Thesis: *Understanding the Neural Basis of Speech Production Using Machine Learning*
- Master's degree requirements completed while working towards obtaining my Ph.D.

2014 - 2015 **University of Cambridge – Master of Philosophy (M.Phil.) in Advanced Computer Science** UK

- Advised by **Prof. Pietro Lió**
- Thesis: *Machine Learning Methods for Computational Microscopy*
- Pass with Distinction

2010 - 2014 **Politehnica University of Timisoara - B.Eng. in Computer Science and Information Technology** Romania

- GPA: 9.98 (10.0 scale)
- 1st out of 140 students

2012 - 2013 **Linköping University - Erasmus Exchange Student** Sweden

- I spent the third year of my undergraduate studies as an Erasmus exchange student at Linköping University, Sweden.

WORK EXPERIENCE

2021-now **Research Scientist at Google AI Research** USA

- Full-time research scientist at **Google AI** in Mountain View, CA, USA.

Spring 2019 **Student Researcher at Google AI Research** USA

- Part time internship in the **Expander team** in **Google AI Research**.
- Research on deep learning models for graph-based semi-supervised learning, published at NeurIPS 2019.

Summer 2018 **Software Engineering Intern at Google AI Research** USA

- **Expander team** in **Google AI Research**, Mountain View, CA, USA.
- Research on deep learning models for graph-based semi-supervised learning.

Summer 2016 **Software Engineering Intern at Google X** USA

- **Self-Driving Car team** in **Google X** (current Waymo), Mountain View, CA, USA.
- Undisclosed machine learning project for the Google self-driving car.

Summer 2014 **Software Developer Intern at Microsoft** USA

- **Cortana team** at **Microsoft**, Redmond, WA, USA.
- Undisclosed machine learning project for Cortana, Windows' digital personal assistant.

RESEARCH PUBLICATIONS

* *denotes equal contribution and joint lead authorship.*

NeurIPS **Modeling Task Effects on Meaning Representation in the Brain via Zero-Shot MEG Prediction.** 2020
M. Toneva*, **O. Stretcu***, B. Póczos, L. Wehbe, T. Mitchell,
In Proceedings of the Thirty-Fourth Conference on Neural Information Processing Systems, 2020.

AAAI **Contextual Parameter Generation for Knowledge Graph Link Prediction** 2020
G. Stoica*, **O. Stretcu***, E.A. Platanios*, T. Mitchell, B. Póczos
In Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence, 2020.

ICLR **Coarse-to-Fine Curriculum Learning**
O. Stretcu, E.A. Platanios, T. Mitchell, B. Póczos
In International Conference on Learning Representations (ICLR) Workshop on Bridging AI and Cognitive Science (BAICS), 2020.

NeurIPS **Graph Agreement Models for Semi-Supervised Learning** 2019
O. Stretcu, K. Viswanathan, D. Movshovitz-Attias, E.A. Platanios, S. Ravi, A. Tomkins
In Proceedings of the Thirty-third Conference on Neural Information Processing Systems, 2019.

NeurIPS **Contextual Parameter Generation for Knowledge Graph Link Prediction**
G. Stoica*, **O. Stretcu***, E.A. Platanios*, T. Mitchell, B. Póczos
In Neural Information Processing Systems Workshop on Graph Representation Learning, 2019.

UAI **Efficient Multitask Feature and Relationship Learning.**
H. Zhao, **O. Stretcu**, R. Negrinho, A. Smola, G. Gordon.
In Proceedings of the 2019 Annual Conference on Uncertainty in Artificial Intelligence 2019.

HBM **Investigating Task Effects on Brain Activity During Stimulus Presentation in MEG.**
O. Stretcu*, M. Toneva*, B. Póczos, and T. Mitchell.
Accepted for poster presentation at the Human Brain Mapping Conference, 2019.

NAACL **Competence-based Curriculum Learning for Neural Machine Translation.**
E A. Platanios, **O. Stretcu**, G. Neubig, B. Póczos, and T. Mitchell.
Oral presentation at the Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2019.

JNeuro **Subthalamic nucleus and sensorimotor cortex activity during speech production.**
A. Chrabaszcz, W. J. Neumann, **O. Stretcu**, W.J. Lipski, A. Bush, C. Dastolfo-Hromack, D. Wang, D. J. Crammond, S. Shaiman, M. Walsh Dickey, L.L. Holt, R. S. Turner, J.A. Fiez, and R. M. Richardson
The Journal of Neuroscience : the Official Journal of the Society for Neuroscience, 2019.

SDM **BRAINZOOM: High Resolution Reconstruction from Multi-modal Brain Signals** 2017
X. Fu*, K. Huang*, **O. Stretcu***, H. Song*, E.E. Papalexakis, P. Talukdar, N.D. Sidiropoulos, C. Faloutsos, T. Mitchell, and B. Póczos.
Oral presentation at SIAM International Conference on Data Mining (SDM), 2017

NeurIPS **Efficient Multitask Feature and Relationship Learning**
H. Zhao, **O. Stretcu**, R. Negrinho, A. Smola, G. Gordon.
NeurIPS Workshop on Learning with Limited Labeled Data: Weak Supervision and Beyond, 2017

CMU **Understanding the neural basis of speech production using Machine Learning**
O. Stretcu.
Master's Thesis in Machine Learning at Carnegie Mellon University, 2017

BMVC **Multiple Frames Matching for Object Discovery in Video.** 2015
O. Stretcu, M. Leordeanu.
In British Machine Vision Conference (BMVC), 2015.

EMIM **A multi-method driven evaluation of molecular imaging techniques.**
O. Stretcu, Y. Shavit, and P. Lio
Poster presentation at the 10th Annual Meeting of the European Society for Molecular Imaging (ESMI), 2015.

OTHER RESEARCH EXPERIENCE

2014 - 2015 **Independent Research Project in Computer Vision** Romania
- Research project in collaboration with **Dr. Marius Leordeanu** from the Institute of Mathematics of the Romanian Academy (IMAR).
- Research on unsupervised object discovery in video based on multiple frames matching, published at BMVC 2015.

Summer 2013 **Research Internship in Machine Learning at EPFL** Switzerland
- Research internship at École Polytechnique Fédérale de Lausanne, Laboratory for Probabilistic Machine Learning, advised by **Dr. Matthias Seeger**.
- I used topic models to explore the correlation between social media messages from Twitter and user locations, with applications to content recommendation, user profiling and topic tracking. I applied various machine learning models and parallelized the code in order to scale well.

Summer 2011 **Research for Undergraduates Program** Romania
- Advised by **Prof. Emilia Petrisor** at Politehnica University of Timisoara, Romania.
- I implemented algorithms for spectral clustering of nodes in a graph, based on minimum graph cut, with applications to data mining and statistics, such as clustering information from documents on the Web and medical images segmentation.

HONORS AND AWARDS

FELLOWSHIPS

- **Center for Machine Learning and Health (CMLH)** Fellowship in Digital Health (2018)

SCHOLARSHIPS

- **Gates Cambridge Scholarship** (2014)
- **Google Anita Borg Memorial Scholarship** (2013)
- **GE (General Electric) Foundation Scholar Leaders Program** (2012)

AWARDS

- Best poster award at the *Eastern European Machine Learning Summer School* in Bucharest, Romania (2019).
- Machine Learning Department Teaching Assistant Award (2018)
- Carnegie Mellon University Neurohackathon: 2nd place (2017)
- KTH University Programming Challenge, Sweden: Top 10 contestants (2013)
- ACM International Collegiate Programming Contest (**ACM-ICPC**):
  - Honorable Mention in Southeastern European Regional (2013, 2012, 2011)
- **Microsoft Imagine Cup**:
  - Top 20 in the World Finals (2012)
  - 1st team in the Romanian National Finals (2012)
- **Romanian National Olympiad in Informatics**:
  - Gold Medal (2008)
  - Bronze Medal (2010)
  - 1st Place (2004)
  - 2nd Place (2005)
  - Honorable Mention (2010, 2008, 2007, 2003)
- Kangaroo International Mathematical Competition: 2nd in Romanian National Finals (2009, 2010)

TEACHING EXPERIENCE

Spring 2018 **Teaching Assistant for Graduate Machine Learning.** USA
- Graduate level introduction to machine learning class 10-701 Graduate Machine Learning at Carnegie Mellon University.
- Taught by **Prof. Pradeep Ravikumar** and **Prof. Manuela Veloso**
- I was awarded a Machine Learning Department Teaching Assistant Award.

Fall 2017 **Teaching Assistant for Topics in Deep Learning.** USA
- Graduate level deep learning class 10-707 Topics in Deep Learning at Carnegie Mellon University.
- Taught by **Prof. Ruslan Salakhutdinov**.

2013 - 2014 **Teaching algorithms for competitive programming.** Romania
- Co-organized a competitive programming seminar at Politehnica University of Timisoara for university and high-school students interested to train for algorithmic competitions (e.g. ACM-ICPC, informatics olympiad).
- Taught algorithms and data structures used in competitive programming, designed and solved practice problems and internal competitions.

INVITED TALKS

- Invited talk at the Quantitative Research Colloquium (QRC) hosted by Morgan Stanley (2021).
- Invited talk at Health@Scale on Graph Agreement Models for Semi-Supervised Learning (2020).
- Represented CMU at the MIDAS Data Science Annual Symposium at the University of Michigan (2019).
- Talk at the CMU AI Seminar on Contextual Parameter Generation for Knowledge Graph Link Prediction (2019).

SERVICES

- **Mentorship:**
  - Mentor for the CMU AI mentoring program (2019 - now)
  - Mentor for junior PhD students at CMU (2019 - now)
- **Program Committees:** I was a reviewer for the following journals, conferences and workshops: ICML (2019), AISTATS (2019, 2020), ICLR (2018, 2020), ICLR-LLD (2019), PLOS ONE (2019), ICML-GRL (2020), NeurIPS (2020), AAAI (2021).
- **Conference Workshops Organized:** Adaptive & Multitask Learning at ICML 2019
- **Other leadership and volunteering activities:**
  - 2018 - now: Founding member of the AI+ Club at Carnegie Mellon University (CMU).
  - 2016 - now: Member of the Doctoral Review Committee of the Machine Learning Department at CMU, which aims to improve the PhD program.
  - 2018 - 2019: Treasurer of the Romanian Students Association at CMU.
  - 2016 - 2018: President of the Romanian Students Association at CMU.
  - 2011 - 2012: Student representative in the faculty leadership board at Politehnica University of Timisoara.
  - 2010 - 2011: Volunteer for AIESEC, international youth organization.
  - 2010 - 2012: Volunteer for Liga AC, student organization at Politehnica University.

COMPUTER SKILLS

- **Programming languages**: Python, C, C++, Matlab, Java.
- **Data Structures and Algorithms**: Familiarity with concepts used in algorithmic competitions and machine learning research.
- **Frameworks**: TensorFlow, NumPy, SciPy, Pandas.
- **Database Systems**: MySQL.

TECHNICAL PROJECTS

- **LiveX Learning Platform**: Tutoring system for kindergarten and school children based on a software platform that runs in the cloud, Windows Phone 7 devices and a set of electronic learning cubes called “IQubes" (our hardware invention) as part of team IQube that competed in the world finals of the Microsoft Imagine Cup competition.
- **Face and Hand Gesture Recognition for Human - Computer Interaction**: Framework for C++ developers to extend their graphical user interfaces with more natural means of communication. Works in real-time using a computer web camera.
- **Public Transport Route Recommendation**: Python application for the Timisoara city public transport system using real-time information from GPS devices installed on public transport vehicles. Overlays optimal routes suggestions on Google Maps (before Google supported this feature).
- **Handwritten digits recognition**: C library implementing various linear algebra methods for handwritten digits recognition.

OTHER INTERESTS

- Sports: squash, volleyball, tennis, climbing, hiking.
- Hobbies: traveling, painting, movies, arts and crafts, learning languages on Duolingo.