

# Otilia Stretcu

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

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## RESEARCH AREAS

My PhD 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 controls speech.

## EDUCATION

- 2015 - now **Carnegie Mellon University – Ph.D. in Machine Learning** USA
- Co-advised by **Prof. Barnabàs Póczos** and **Prof. Tom Mitchell**
  - GPA: 4.0 (4.0 scale)
  - Thesis topic: *Curriculum Learning*
  - Thesis committee: Tom Mitchell, Barnabàs Póczos, Ruslan Salakhutdinov, Rich Caruana
- 2015 - 2017 **Carnegie Mellon University – M.S. in Machine Learning** USA
- Co-advised by **Prof. Barnabàs Póczos** 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

- 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.

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|---------|--|------|
| NeurIPS | <b>Modeling Task Effects on Meaning Representation in the Brain via Zero-Shot MEG Prediction.</b><br>M. Toneva*, <b>O. Stretcu</b> *, B. Póczos, L. Wehbe, T. Mitchell,<br><i>In Proceedings of the Thirty-Fourth Conference on Neural Information Processing Systems, 2020.</i> | 2020 |
| AAAI    | <b>Contextual Parameter Generation for Knowledge Graph Link Prediction</b><br>G. Stoica*, <b>O. Stretcu</b> *, E.A. Platanios*, T. Mitchell, B. Póczos<br><i>In Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence, 2020.</i>                           |      |

ICLR	<b>Coarse-to-Fine Curriculum Learning</b> <b>O. Stretcu</b> , E.A. Platanios, T. Mitchell, B. Póczos <i>In International Conference on Learning Representations (ICLR) Workshop on Bridging AI and Cognitive Science (BAICS), 2020.</i>	2020
NeurIPS	<b>Graph Agreement Models for Semi-Supervised Learning</b> <b>O. Stretcu</b> , K. Viswanathan, D. Movshovitz-Attias, E.A. Platanios, S. Ravi, A. Tomkins <i>In Proceedings of the Thirty-third Conference on Neural Information Processing Systems, 2019.</i>	2019
NeurIPS	<b>Contextual Parameter Generation for Knowledge Graph Link Prediction</b> G. Stoica <sup>*</sup> , <b>O. Stretcu</b> <sup>*</sup> , E.A. Platanios <sup>*</sup> , T. Mitchell, B. Póczos <i>In Neural Information Processing Systems Workshop on Graph Representation Learning, 2019.</i>	
UAI	<b>Efficient Multitask Feature and Relationship Learning.</b> H. Zhao, <b>O. Stretcu</b> , R. Negrinho, A. Smola, G. Gordon. <i>In Proceedings of the 2019 Annual Conference on Uncertainty in Artificial Intelligence 2019.</i>	
HBM	<b>Investigating Task Effects on Brain Activity During Stimulus Presentation in MEG.</b> <b>O. Stretcu</b> <sup>*</sup> , M. Toneva <sup>*</sup> , B. Póczos, and T. Mitchell. <i>Accepted for poster presentation at the Human Brain Mapping Conference, 2019.</i>	
NAACL	<b>Competence-based Curriculum Learning for Neural Machine Translation.</b> E A. Platanios, <b>O. Stretcu</b> , G. Neubig, B. Póczos, and T. Mitchell. <i>Oral presentation at the Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2019.</i>	
JNeuro	<b>Subthalamic nucleus and sensorimotor cortex activity during speech production.</b> A. Chrabaszcz, W. J. Neumann, <b>O. Stretcu</b> , 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 <i>The Journal of Neuroscience : the Official Journal of the Society for Neuroscience, 2019.</i>	
SDM	<b>BRAINZOOM: High Resolution Reconstruction from Multi-modal Brain Signals</b> X. Fu <sup>*</sup> , K. Huang <sup>*</sup> , <b>O. Stretcu</b> <sup>*</sup> , H. Song <sup>*</sup> , E.E. Papalexakis, P. Talukdar, N.D. Sidiropoulos, C. Faloutsos, T. Mitchell, and B. Póczos. <i>Oral presentation at SIAM International Conference on Data Mining (SDM), 2017</i>	2017
NeurIPS	<b>Efficient Multitask Feature and Relationship Learning</b> H. Zhao, <b>O. Stretcu</b> , R. Negrinho, A. Smola, G. Gordon. <i>NeurIPS Workshop on Learning with Limited Labeled Data: Weak Supervision and Beyond, 2017</i>	
CMU	<b>Understanding the neural basis of speech production using Machine Learning</b> <b>O. Stretcu.</b> <i>Master's Thesis in Machine Learning at Carnegie Mellon University, 2017</i>	
BMVC	<b>Multiple Frames Matching for Object Discovery in Video.</b> <b>O. Stretcu</b> , M. Leordeanu. <i>In British Machine Vision Conference (BMVC), 2015.</i>	2015
EMIM	<b>A multi-method driven evaluation of molecular imaging techniques.</b> <b>O. Stretcu</b> , Y. Shavit, and P. Lio <i>Poster presentation at the 10th Annual Meeting of the European Society for Molecular Imaging (ESMI), 2015.</i>	

## OTHER RESEARCH EXPERIENCE

2014 - 2015	<b>Independent Research Project in Computer Vision</b> <ul style="list-style-type: none"> <li>■ Research project in collaboration with <b>Dr. Marius Leordeanu</b> from the Institute of Mathematics of the Romanian Academy (IMAR).</li> <li>■ Research on unsupervised object discovery in video based on multiple frames matching, published at BMVC 2015.</li> </ul>	Romania
Summer 2013	<b>Research Internship in Machine Learning at EPFL</b> <ul style="list-style-type: none"> <li>■ Research internship at École Polytechnique Fédérale de Lausanne, Laboratory for Probabilistic Machine Learning, advised by <b>Dr. Matthias Seeger</b>.</li> <li>■ 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.</li> </ul>	Switzerland
Summer 2011	<b>Research for Undergraduates Program</b> <ul style="list-style-type: none"> <li>■ Advised by <b>Prof. Emilia Petrisor</b> at Politehnica University of Timisoara, Romania.</li> <li>■ 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.</li> </ul>	Romania

## 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 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.