

Emmanouil Antonios Platanios

Date of Birth: 07/07/1991

Nationality: Greek

Languages: Greek (native), English (fluent), German (beginner)

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RESEARCH AREAS

Machine learning and artificial intelligence with a focus on learning collections of functions, neural cognitive architectures, and applications of AI and ML to natural language processing, robotics, computer vision and finance.

EDUCATION

2013-2020 **Carnegie Mellon University – Ph.D. in Machine Learning.**

USA

- Awarded the **CMU Presidential Fellowship**.
- GPA: **4.18** (4.0 scale).
- Advisor: **Prof. Tom M. Mitchell**.
- I worked on the **Never Ending Language Learning (NELL)** project.
- My thesis work was on **Learning Collections of Functions**.
- I performed research on topics related to **self-reflection in machine learning**:
 - I developed multiple methods for using unlabeled data to estimate the accuracies of several different classifiers performing the same task, that I have presented at Uncertainty in Artificial Intelligence (**UAI**) in 2014, International Conference in Machine Learning (**ICML**) in 2016, and at Neural Information Processing Systems (**NIPS**) in 2017.
 - I developed a method for performing **low-resource and zero-shot multilingual machine translation**, that I presented at the conference on Empirical Methods in Natural Language Processing (**EMNLP**), and a method for performing **curriculum learning**, that I presented at the annual conference of the North American Chapter of the Association for Computational Linguistics (**NAACL**).

2013-15 **Carnegie Mellon University – M.S. in Machine Learning.**

USA

- GPA: 4.18 (4.0 scale).
- Advisor: Prof. Tom M. Mitchell.
- Thesis: **Estimating Accuracy from Unlabeled Data**.
- Master's degree requirements completed while working towards my Ph.D. in machine learning.

2009-13 **Imperial College London – M.Eng. and ACGI in Electrical and Electronic Engineering.**

UK

- Integrated Bachelor's and Master's degree.
- **Dean's List** for exceptional academic performance (all four years)
- Grade: 91.67% (top 1% of class) with **92.37%** on the final exams - **First-Class Honors Degree**.
 - Equivalent to 4.0 GPA in the USA academic system.
- Thesis: **Human Motion Classification Using Statistical Machine Learning Methods**.
 - Awarded the **Sir Bruce White prize in engineering** for the best final year project.
- Third Year Summer Research Project: "Bayesian Machine Learning Methodologies for Modeling Time Series with High Volatility" with significance both for industry (e.g. finance) and academia.

WORK EXPERIENCE

2023-now **Research Scientist at Scaled Cognition.**

USA

- Developing a new generation of rational, controllable AI models deployable as domain experts for grounded, real-world applications.

2023 **Senior Principal Researcher (L67) at Microsoft Semantic Machines.**

USA

- Served as a technical leader, managing a team across both research and engineering, and helping set technical direction for the broader organization. I invested heavily in aligning research and engineering, and I worked closely with multiple partner teams at Microsoft to deliver on our objectives, while also helping improve the underlying platform and infrastructure that we leveraged.

2022 **Principal Researcher (L65) at Microsoft Semantic Machines.**

USA

- Led the design and development of a system that learns to predict the next user action (e.g., sending an email, opening a file, adding specific people to a calendar invite, etc.) based on what a user and others in their network have been doing. Underlying this system is a novel Foundation Model over user actions.
- 2020-22 **Senior Researcher (L64) at Microsoft Semantic Machines.** USA
 - Manager: **Dan Klein**, Technical Fellow.
 - Designed and shipped a contextual semantic parser that powers the Semantic Machines conversational AI platform.
 - Worked on multiple research projects leading to academic publications at the intersection of natural language processing and machine learning.
- 2015 **Research Intern at Microsoft Research.** USA
- 2016-17 **Research Analyst Consultant at Cubist Systematic Strategies.** USA
 - Worked for the Advanced Methods Groups (AMG) in new machine learning-driven approaches for end-to-end algorithmic trading systems.
 - Developed the main pipeline for trading algorithms research and for integrating these algorithms in a new production system.
- 2015 **Research Intern at Microsoft Research.** USA
 - Manager: **Dr. Eric Horvitz**, Distinguished Scientist and Managing Director of Microsoft Research.
 - Collaborators: **Dr. Hoifung Poon** and **Dr. Ashish Kapoor**.
 - First 3 months: Developed a probabilistic logic-based approach for accuracy estimation using unlabeled data, as part of the Literome Project.
 - Last 3 months: Active learning amidst logical knowledge.
- 2010-13 **Co-Founder, President and Chief Technology Officer (CTO) at Holic.** Greece
 - Developed an intelligent news reader application.
 - Developed algorithms utilizing advanced nonparametric Bayesian models for clustering news articles and for user profiling.
 - Received €400,000 funding from the following investors:
 - Dr. John Coustas, President & CEO of Danaos Corporation.
 - Mr. Leon Yohai, Founder & CEO of ZuluTrade.
- 2008-10 **Founder of Project Protasis – Forest Protection.** Greece
 - Developed a forest fire detection and prevention system.
 - Developed both hardware and software (involving use of neural networks for recognizing fire and smoke in photos).
 - Installed prototype in “*Alsos Syggrou*”, a wooded area in Athens, funded by the Greek government.
 - Got patent approved in Greece (**Patent #: 20110100016**) and international patent pending approval.
 - Interviewed by CNN, several newspapers, magazines and other TV channels, regarding this project.
 - Won the 2nd place in the **Microsoft Imagine Cup 2009 Greek Finals** with this project.
- 2010 **Web Designer and Software Developer at Curtinmakers S.A.** Greece
- 2007-09 **Founder of Project Protasis – Home Automation.** Greece
 - Developed a smart home automation system that controls all electrical appliances, heating systems and water systems and aims to reduce domestic energy consumption while making the lives of homeowners as comfortable as possible.
 - Developed software, employing several machine learning algorithms.
 - Was funded by the Greek government and more specifically, by the Organization of School Buildings.
 - Interviewed by NBC, several newspapers, magazines and other TV channels, regarding this project.
 - Won the **Microsoft Imagine Cup 2008 Greek Finals** with this project and represented Greece in the Imagine Cup 2008 Worldwide Finals, in Paris, France, competing against teams from universities, at age of only 16 and having worked without a team or a mentor.

PATENTS

- 2022/07/28 **Speculative Execution of Dataflow Program Nodes (US 17/815,904).**
- 2021/04/13 **Semantic Parsing of Utterance Using Contractive Paraphrasing (US 17/229,637).**

OPEN SOURCE PROJECTS

- 2017-now **TensorFlow Scala**: Machine learning library and API for the TensorFlow framework developed by Google, that is currently being used by multiple researchers and companies (~900 GitHub stars).
- 2019-20 **Swift for TensorFlow**: I was a contributor to this project, which is a machine learning library and API for the TensorFlow framework developed by Google, and that enables differentiable programming.

- 2018 **Symphony MT**: Scala machine translation library that supports various models along the whole translation pipeline (i.e., ranging from data preprocessing and vocabulary generation, to encoder and decoder models).
- 2014-16 **Makina**: Machine learning and optimization library written in Java that includes a scalable implementation of the Probabilistic Soft Logic (PSL) framework.

RESEARCH PUBLICATIONS

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- EMNLP **When More Data Hurts: A Troubling Quirk in Developing Broad-Coverage Natural Language Understanding Systems** 2019
Elias Stengel-Eskin, **Emmanouil A. Platanios**, Adam Pauls, Sam Thomson, Hao Fang, Benjamin Van Durme, Jason Eisner, and Yu Su.
In the Conference on Empirical Methods in Natural Language Processing.
- ACL **Online Semantic Parsing for Latency Reduction in Task-Oriented Dialogue.**
Jiawei Zhou, Jason Eisner, Michael Newman, **Emmanouil A. Platanios**, and Sam Thomson.
In the Annual Meeting of the Association for Computational Linguistics (Outstanding Paper Award).
- ACL **Bridging the Generalization Gap in Text-to-SQL Parsing with Schema Expansion.**
Chen Zhao, Yu Su, Adam Pauls, and **Emmanouil A. Platanios**.
In the Annual Meeting of the Association for Computational Linguistics.
- ACL **Guided K-best Selection for Semantic Parsing Annotation.**
Anton Belyy*, Chieh-Yang Huang*, Jacob Andreas, **Emmanouil A. Platanios**, Sam Thomson, Richard Shin, Subhro Roy, Aleksandr Nisnevich, Charles Chen, and Benjamin Van Durme.
In the Annual Meeting of the Association for Computational Linguistics.
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- AAAI **Re-TACRED: Addressing Shortcomings of the TACRED Dataset.** 2021
George Stoica, **Emmanouil A. Platanios**, and Barnabás Póczos.
In the AAAI Conference on Artificial Intelligence.
- EMNLP **Constrained Language Models Yield Few-Shot Semantic Parsers.**
Richard Shin, Christopher Lin, Sam Thomson, Charles Chen, Subhro Roy, **Emmanouil A. Platanios**, Adam Pauls, Dan Klein, Jason Eisner, and Benjamin Van Durme.
In the Conference on Empirical Methods in Natural Language Processing.
- ACL **Value-Agnostic Conversational Semantic Parsing.**
Emmanouil A. Platanios, Adam Pauls, Subhro Roy, Yuchen Zhang, Alex Kyte, Alan Guo, Sam Thomson, Jayant Krishnamurthy, Jason Wolfe, Jacob Andreas, and Dan Klein.
In the Annual Meeting of the Association for Computational Linguistics.
- ICLR **HyperDynamics: Generating Expert Dynamics Models by Observation.**
Zhou Xian, Shamit Lal, Hsiao-Yu Fish Tung, **Emmanouil A. Platanios**, and Katerina Fragkiadaki.
In the International Conference on Learning Representations.
- NAACL **Compositional Generalization for Neural Semantic Parsing via Span-level Supervised Attention.**
Pengcheng Yin, Hao Fang, Graham Neubig, Adam Pauls, **Emmanouil A. Platanios**, Yu Su, Sam Thomson, and Jacob Andreas.
In the Conference of the North American Chapter of the Association for Computational Linguistics.
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- CMU **Learning Collections of Functions** 2020
Emmanouil A. Platanios.
Doctoral Thesis at Carnegie Mellon University.
- AAAI **Contextual Parameter Generation for Knowledge Graph Link Prediction.**
Emmanouil A. Platanios*, Otilia Stretcu*, George Stoica*, Barnabas Poczos, and Tom M. Mitchell.
In the AAAI Conference on Artificial Intelligence.
- ICLR **Jelly Bean World: A Testbed for Never-Ending Learning.**
Emmanouil A. Platanios*, Abulhair Saparov*, and Tom M. Mitchell
In the International Conference on Learning Representations.
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- NAACL **Competence-based Curriculum Learning for Neural Machine Translation.** 2019
Emmanouil A. Platanios, Otilia Stretcu, Graham Neubig, Barnabas Póczos, and Tom M. Mitchell.
In the Conference of the North American Chapter of the Association for Computational Linguistics (Oral Presentation).
- NeurIPS **Graph Agreement Models for Semi-Supervised Learning.**
Otilia Stretcu, Krishnamurthy Viswanathan, Dana Movshovitz-Attias, **Emmanouil A. Platanios**, Sujith Ravi, and Andrew Tomkins
In Neural Information Processing Systems.

EMNLP	Contextual Parameter Generation for Universal Neural Machine Translation. Emmanouil A. Platanios , Mrinmaya Sachan, Graham Neubig, and Tom M. Mitchell. <i>In Empirical Methods in Natural Language Processing.</i>	2018
CACM	Never-Ending Learning. Tom M. Mitchell, William Cohen, Estevam Hruschka, Partha Talukdar, Bishan Yang, Justin Betteridge, Andrew Carlson, Bhavana Dalvi, Matt Gardner, Bryan Kisiel, Jayant Krishnamurthy, Ni Lao, Kathryn Mazaitis, Tahir Mohammad, Ndapa Nakashole, Emmanouil A. Platanios , Alan Ritter, Mehdi Samadi, Burr Settles, Richard Wang, Derry Wijaya, Abhinav Gupta, Xinlei Chen, Abulhair Saparov, Malcolm Greaves, and Max Welling. <i>In Communications of the ACM, May 2018, Vol. 61 No. 5, Pages 103-115, 10.1145/3191513.</i>	
NeurIPS	Estimating Accuracy from Unlabeled Data: A Probabilistic Logic Approach. Emmanouil A. Platanios , Hoifung Poon, Tom M. Mitchell, and Eric Horvitz. <i>In Neural Information Processing Systems.</i>	2017
ICML	Estimating Accuracy from Unlabeled Data: A Bayesian Approach. Emmanouil A. Platanios , Avinava Dubey, and Tom M. Mitchell. <i>In International Conference in Machine Learning.</i>	2016
CMU	Estimating Accuracy from Unlabeled Data. Emmanouil A. Platanios. <i>Master's Thesis at Carnegie Mellon University.</i>	2015
AAAI	Never-Ending Learning. Tom M. Mitchell, William Cohen, Estevam Hruschka, Partha Talukdar, Justin Betteridge, Andrew Carlson, Bhavana Dalvi, Matt Gardner, Bryan Kisiel, Jayant Krishnamurthy, Ni Lao, Kathryn Mazaitis, Tahir Mohammad, Ndapa Nakashole, Emmanouil A. Platanios , Alan Ritter, Mehdi Samadi, Burr Settles, Richard Wang, Derry Wijaya, Abhinav Gupta, Xinlei Chen, Abulhair Saparov, Malcolm Greaves, and Max Welling. <i>In AAAI Conference on Artificial Intelligence.</i>	
UAI	Estimating Accuracy from Unlabeled Data. Emmanouil A. Platanios , Avrim Blum, and Tom M. Mitchell. <i>In Uncertainty in Artificial Intelligence.</i>	2014
TPAMI	A Mixture Gaussian Process Conditional Heteroscedasticity Model with Power-Law Nature. Emmanouil A. Platanios and Sotirios P. Chatzis. <i>In IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 36(5), pp. 888-900.</i>	
NIPS	Nonparametric Mixtures of Multi-Output Heteroscedastic Gaussian Processes for Volatility Modeling. Emmanouil A. Platanios and Sotirios P. Chatzis. <i>In the "Modern Nonparametric Methods in Machine Learning" Neural Information Processing Systems workshop.</i>	2012

HONORS AND AWARDS

- 2017 – 2nd place in the CMU NeuroHackathon.
- 2016-17 – **CMU Presidential Fellowship.**
- 2010-13 – **Sir Bruce White prize in engineering** for the best M.Eng. thesis at Imperial College London.
- **Dean's List** at Imperial College London, for exceptional academic performance (all four years).
- 2010 – Nomination for the RAE (UK Royal Academy of Engineering) presentation skills award.
- "Roll of Honor" of the Electrical and Electronic Engineering department of Imperial College London, for the best software design project in the year.
- 2009 – Congratulatory diploma for my work on "Project Protasis – Home Automation" by **UNESCO.**
- **Honorary plaque** by the **Greek Minister of Education and Religious Affairs** for honoring my country internationally.
- 2007-08 – **Full scholarship** (of about €12,000) by "Geitonas School", for honoring my school internationally.
- Had a **computer science laboratory named after me** in "Geitonas School", for honoring my school internationally.
- Awarded €1,000 by the **President of the Greek Parliament**, for honoring my country internationally.
- **Honorary plaque** by the Mayor of my city, Vari, in Greece, for honoring my country internationally.
- Represented Greece in the **Microsoft Imagine Cup 2008 Worldwide Finals**, in Paris, France.
- 1st place in the Microsoft Imagine Cup 2008 Greek Finals with "Project Protasis - Home Automation", competing against teams from universities, at age of only 16 and having worked without a team or a mentor (also won the 2nd place in the Microsoft Imagine Cup 2009 Greek Finals with "Project Protasis - Forest Protection").
- 2007 – **Certificate of Excellence** for the school year 2006-07 from the Greek Ministry of Education and Religious Affairs.
- 3rd place (bronze medal) in the **Greek Mathematics Olympiad**, organized by the Hellenic Mathematical Society.

2003-07 – **11 scholarships** and competitions in the fields of mathematics, sciences and computer science.

TEACHING EXPERIENCE

2018 **Provided support for an advanced graduate-level course on machine learning at Carnegie Mellon University.** USA

- Class: 10-812 Architectures for Never-Ending Learning.
- Taught by **Prof. Tom Mitchell**.
- Gave a couple of lectures and helped with the organization of the class.
- Designed and co-led the implementation of the software testbed used to support the course projects.
- Mentored several students working on class projects.

2014, 16 **Teaching Assistant for a graduate-level machine learning course at Carnegie Mellon University.** USA

- Class: 10-701/15-781 Introduction to Machine Learning
- Did this for two semesters:
 - Taught by **Prof. Geoff Gordon** and **Prof. Aarti Singh** in 2014.
 - Taught by **Prof. Tom Mitchell** in 2016.
- Gave some lectures and some recitation lectures.
- Mentored several groups of students working on class projects.
- Wrote and graded homework assignments and exams.

SERVICES

- Program Committees: NeurIPS (2018-23), TMLR (2023), ACL (2020), JMLR (2020), EMNLP (2018-20), ICML (2019), PLOS-ONE (2018-19), IEEE-TPAMI (2018), and NIPS-AKBC (2016).
- Conference Workshops Organized:
 - 2019: ICML Adaptive & Multi-Task Learning.
 - 2019: ICLR Learning with Limited Labeled Data.
 - 2017: NIPS Learning with Limited Labeled Data.
- University Committees:
 - 2018-20: CMU MLD Blog co-founder and editor.
 - 2018-19: CMU AI+ Club co-founder and leadership team member.
 - 2018-19: Doctoral review committee (DRC) for the CMU Machine Learning Department.
 - 2017-18: Speaking skills committee for the CMU Machine Learning Department.
 - 2016-18: Education review committee (ERC) for the CMU Machine Learning Department.
 - 2014-15: Social committee for the CMU Machine Learning Department.
- Community Service:
 - 2009: Volunteer at the Lavrion refugee center, in Athens, Greece.
 - 2008: Reforestation of mountainside in Rafina, Greece.
 - 2008: Volunteer for the International Baccalaureate Organization (IBO) training workshop.
 - 2008: 13th Annual Underwater and Beach Cleanup in Athens, Greece.
 - 2008: Helped organize the "Christmas Bazaar" (fund raiser project).
 - 2008: Helped organize the "Love Feast" (celebrating family values and fund raising for the victims of forest fires in Greece).
 - 2007: Reforestation in Mani, Greece.
 - 2007: Volunteer at the "AQUA GALA" event for physically challenged children, for the "Hellenic Society for Disabled Children".

INVITED TALKS

2019 **Competence-based Curriculum Learning for Neural Machine Translation.** USA

- North American Chapter of the Association for Computational Linguistics (**NAACL**) conference.

2018 **TensorFlow Scala.** USA

- Invited talk at **Google**.

2014-18 **Estimating Accuracy from Unlabeled Data.** USA

- Neural Information Processing Systems (**NIPS**) conference.
- International Conference in Machine Learning (**ICML**) conference.
- Uncertainty in Artificial Intelligence (**UAI**) conference.
- Invited talk at **Google**.
- AI Lunch at **Stanford University**.
- ML Lunch at **Carnegie Mellon University**.

2012 **Nonparametric Mixtures of Multi-Output Heteroscedastic Gaussian Processes.** USA

- "Nonparametric Methods in Machine Learning" workshop at **NIPS**.

2009 Project Protasis – Forest Protection.

Greece

- **Microsoft Hellas Headquarters.**
- **Ministry of Transportation** of the Greek government (the Ministry later funded a pilot program).

2008 Project Protasis – Home Automation.

Greece, France

- **Microsoft Hellas Headquarters.**
- **Louvre Museum** in Paris, France, as part of Imagine Cup.
- UNESCO International Conference on Climate Change and Challenges for the Future Generations.
- **Organization of School Buildings** of the Greek government (later received funding for a pilot program from the Ministry of Education and Religious Affairs).
- 73rd Thessaloniki International Fair.
- Generation Next 0-18 fair, in Athens.
- 4th International Conference on Information and Communication Technologies in Bio and Earth Sciences (HAICTA 2008), in Athens.

SOFTWARE DEVELOPMENT SKILLS

- GitHub: <https://github.com/eaplatanios> (~1.2k stars from open-source projects).
- Machine Learning Frameworks: PyTorch, TensorFlow.
- Programming Languages: Rust, Python, Scala, Swift, Java, C#, C, C++, MATLAB, Mathematica, ...

OTHER INTERESTS

- Sports: Tennis, Squash, Winter Skiing, Basketball, Sailing, and Windsurfing.
- Hobbies: Traveling, Philosophy, and Politics (I also really want to learn to play the Guitar).