

Giannis Karamanolakis

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Research Overview and Interests

My research has been focusing on **minimally-supervised learning** frameworks to address real-world NLP applications without the costly requirement of large-scale labeled data. My work leverages alternative types of expert knowledge as supervision for deep neural networks and has been shipped into real-world operational systems with an immediate impact on humans.

Research interests: Machine Learning, Information Extraction, Natural Language Processing, Deep Learning, Interactive Machine Teaching, Semi/Weakly-Supervised Learning, Cross-lingual Learning, Question Answering, Semantic Parsing.

Professional and Research Experience

5. **Columbia University**, Department of Computer Science, New York, NY, United States. 09/2017 - now
Graduate Research Assistant
Advisors: Luis Gravano, Daniel Hsu.
 - Developing minimally-supervised learning algorithms for text mining (LLD'19, WNUT'19, EMNLP'19/20, LOUHI'20).
 - Deploying systems for "Information Extraction from Social Media for Actionable Inferences in Public Health" (NSF).
4. **Microsoft Research AI**, Redmond, WA, United States. 05/2020 - 08/2020
Research Scientist Intern
Supervisors: Ahmed Awadallah, Subho Mukherjee, Guoqing Zheng (Language & Information Technologies team).
 - Developed ASTRA, a semi-supervised learning framework for self-training with expert-defined rules (NAACL '21 paper).
 - Designed a benchmark on semi/weakly-supervised learning for natural language understanding (under submission).
3. **Amazon.com**, Seattle, WA, United States. 05/2019 - 12/2019
Applied Scientist / Machine Learning Scientist Intern
Supervisor: Xin Luna Dong (Product Graph team).
 - Developed TXtract, a neural network for large-scale knowledge extraction from product descriptions (ACL '20 paper).
 - Improved product understanding through 15% higher coverage in knowledge graph construction (KDD '20 paper).
2. **Behavioral Signals**, Los Angeles, United States (worked remotely from Athens, Greece). 04/2016 - 08/2017
Machine Learning Engineer
Supervisor: Shri Narayanan, Alexandros Potamianos.
 - Trained statistical models for recognizing core emotions and key performance indicators from conversational speech.
1. **NCSR "Demokritos"**, Computational Intelligence Laboratory, Athens, Greece. 11/2015 - 2/2016
Research Intern
Supervisors: Theodoros Giannakopoulos, Stavros Perantonis.
 - Developed audio-based classifiers for acoustic event detection and soundscape quality estimation.

Education

2. **Columbia University**, New York, NY, United States. 09/2017 - now
Ph.D. in Computer Science
Advisors: Prof. Luis Gravano, Prof. Daniel Hsu. GPA: 4.26/4.00
1. **National Technical University of Athens**, Athens, Greece. 09/2011 - 07/2017
M.Eng. in Electrical & Computer Engineering (5-year study program, MSc equivalent) GPA: 9.26/10.00
Advisor: Prof. Alexandros Potamianos.
Dissertation: "Grounding Word Semantic Representations to Acoustic and Visual Perceptual Modalities".

Selected Publications

10. **Giannis Karamanolakis**, Subhabrata Mukherjee, Guoqing Zheng, and Ahmed Hassan Awadallah. **Self-Training with Weak Supervision**. In *NAACL*, 2021 (Oral).
9. **Giannis Karamanolakis**, Daniel Hsu, and Luis Gravano. **Cross-Lingual Text Classification with Minimal Resources By Transferring a Sparse Teacher**. In *Findings of EMNLP*, 2020.
8. **Giannis Karamanolakis**, Jun Ma, and Xin Luna Dong. **TXtract: Taxonomy-Aware Knowledge Extraction for Thousands of Product Categories**. In *ACL*, 2020 (Oral).
7. Xin Luna Dong, ..., **Giannis Karamanolakis**, ..., Christos Faloutsos, Andrew McCallum, and Jiawei Han. **AutoKnow: Self-Driving Knowledge Collection for Products of Thousands of Types**. In *KDD*, 2020 (Oral).
6. **Giannis Karamanolakis**, Daniel Hsu, and Luis Gravano. **Leveraging Just a Few Keywords for Fine-Grained Aspect Detection Through Weakly Supervised Co-Training**. In *EMNLP*, 2019 (Oral).
5. **Giannis Karamanolakis**, Daniel Hsu, and Luis Gravano. **Weakly Supervised Attention Networks for Fine-Grained Opinion Mining and Public Health**. In *EMNLP Workshop on Noisy User-generated Text*, 2019 (Oral).
4. **Giannis Karamanolakis**, Daniel Hsu, and Luis Gravano. **Training Neural Networks for Aspect Extraction Using Descriptive Keywords Only**. In *ICLR 2nd Workshop on Learning from Limited Labeled Data*, 2019.
3. Katy Ilonka Gero, **Giannis Karamanolakis**, and Lydia Chilton. **Transfer Learning for Style-Specific Text Generation**. In *NeurIPS Workshop on Machine Learning for Creativity and Design*, 2018.
2. **Giannis Karamanolakis**, Kevin Raji Cherian, Ananth Ravi Narayan, Jie Yuan, Da Tang, and Tony Jebara. **Item Recommendation with Variational Autoencoders and Heterogenous Priors**. In *RecSys Workshop on Deep Learning for Recommender Systems*, 2018 (Oral).
1. **Giannis Karamanolakis**, Elias Iosif, Athanasia Zlatintsi, Aggelos Pikrakis, and Alexandros Potamianos. **Audio-Based Distributional Representations of Meaning Using a Fusion of Feature Encodings**. In *INTER-SPEECH*, 2016 (Oral).

Selected Fellowships, Honors, and Awards

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| 7. Leventis Foundation Scholarship , New York, US | 08/2019, 08/2020, 08/2021 |
| 6. Gerondelis Foundation Scholarship , New York, US | 06/2018 |
| 5. Joseph F. Traub Fellowship , Columbia University, New York, US | 04/2018 |
| 4. Addressing the Opioid Epidemic, Design Challenge Award , Columbia University, New York, US | 12/2017 |
| 3. Columbia Engineering Presidential Fellowship , New York, US | 08/2017 - 05/2022 |
| 2. Eurobank EFG Scholarship , Athens, Greece | 06/2012 |
| 1. Hellenic Mathematic Society "Euclides" & "Thales" Awards , Sitia, Greece | 02/2009, 03/2010 |

Technical Skills, Talks, and Academic Service

- **Programming:** Python (PyTorch, Tensorflow, Keras, Pyro), C++, Java, MATLAB, R, C.
- **Agile Development and Project Management:** Git, JIRA, Jenkins, Scrum, Kanban.
- **Invited Industry Talks:** Two Sigma (Dec. '20), RelationalAI (May '20), NYAS (Mar. '20), AT&T Research Labs (Dec. '19).
- **Conference/Workshop Talks:** NAACL '21, SocialNLP '21, DeeLIO '20, ACL '20, EMNLP '19, RecSys '18, InterSpeech '16.
- **Reviewer Activity:** ICML '21-22 (expert reviewer), NeurIPS '19-21 (top 10% reviewer), ACL Rolling Review '21, ACL '19-21, EMNLP '21, Machine Learning Journal '21, TrueFact '20, TKDD journal '19, WWW '19, IEEE-TETCI '18.
- **Mentoring:** Designed research projects for 12 students (8 undergraduate, 4 graduate); 5 published papers.