Antreas Antoniou

Resume

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Education

2017–2021 **PhD in Machine Learning**, *The University of Edinburgh*.

2016–2017 **MScR in Data Science**, *The University of Edinburgh*.

2014–2015 **MSc in Data Science**, *Lancaster University*.

2011–2014 **BEng in Computer Systems Engineering**, *Lancaster University*.

Research Projects

2021-Current **TALI: Democratizing Multi-Modal Large Scale Machine Learning on via an open source quadra-modal dataset**, *A multi-legged project relating to the curation and evaluation of a large scale multi-modal dataset*.

2021-Current **GATE: Democratizing and Robustifying Representation Learning Evaluation Benchmarks via a Multi-Domain, Multi-Task and Multi-Modal benchmark suite**, *A multi-legged project that aims to diversify and thus robustify empirical evaluations and conclusions via having learned representations evaluated on a barrage of tasks, domains and modalities*.

2017-2021 **PhD Thesis**, *Meta-Learning for Supervised and Unsupervised Few-Shot Learning*, Consisting of [6, 7, 8], Click for draft.

2017 **MScR Thesis**, *Data Augmentation Generative Adversarial Networks*, [**antoniou2018augmenting**, 10].

2014 **BEng Dissertation**, *Fault Tolerant, Self Monitoring Sensors*, Researched a professional-grade sensing system capable of self-validating its own functionality by using signal injection techniques. Further, the system could compensate for any low-level faults as well as predict future faults hours in advance.

Employment

2021-Current **Research Associate on Data-Efficient, Highly Transferable and Robust Generalization Learning**, *University of Edinburgh*.

2020-2021 **Research Intern on Few-Shot Learning**, *Google*, Worked on improving the transferability of Google's few-shot learning systems on extreme domain shift.

2017-2020 **Machine Learning Practical Lead Teaching Assistant, Group Tutor, Demonstrator and Piazza Instructor**, *University of Edinburgh*, Full Description at `https://www.antreas.io/teaching/`.

2016 **Speech-Scientist Intern**, *Amazon*, Worked on improving and extending the capabilities of Amazon Echo.

2015 **Research Associate**, *Lancaster University*, I was a research associate in the Deep Online Cognition project in which a new component-based programming language, called DANA was used to create modular software that can self-adapt to changing states.

2014 **Embedded Systems Research Intern**, *Lancaster University*, I was handpicked by one of my professors to design, build and program new hardware for Blackpool Illuminations. The project involved driving LEDs using pulse width modulation (PWM) and pumps using a technique we researched that allows for high voltage frequency control.

2013 **Software Developer Intern**, *Lancaster University*, Design and implementation of Android app that enabled interaction between presenter and audience in real-time.

Awards and Nominations

2020-2021 Staff Award for being the TA MLP - Full details at `https://www.antreas.io/documents/staff_award.pdf`

2019 5 Teaching Award Nominations on Best Practice in Inclusive Learning Award, Best Support Staff Award, 2 x Best Student Who Tutors Award and Best UK PhD Tutor Award - Full details at `https://www.antreas.io/teaching_awards`

2019 Nominated in the UK Open Source Awards for my MAML++ framework[1]. I was in the top-3 finalists.

2018 Nominated for the Best Student Who Tutors Award

2015 The IBM Prize for Best Data Science Dissertation

2014 MSc Data Science Scholarship

2014 2nd Place in Lancaster University CS Hackathon 2014 competition

Teaching and Research Grants

2021 Google Compute Platform Research Credit Award - Applied for and awarded $13K worth of GCP compute for research

2021 TRC Grant from Google - Applied for and granted compute grant in the form of access to 5 on-demand Cloud TPU v3 devices, 5 on-demand Cloud TPU v2 devices, and 100 preemptible Cloud TPU v2 devices for one month

2017-2020 Teaching Compute Grant - Managed the efficient and effective management of the GCP compute grant for the MLP course

Programming Languages and Deep Learning Frameworks

Intermediate C/C++, HTML, LaTeX, Assembly

Advanced Python, Java

Advanced PyTorch, Tensorflow, Keras, Chainer

Skills

Deep Learning

Development, *Very experienced in designing, implementing, debugging and tuning a large variety of end-to-end differentiable systems, a subset of which include 1) large-scale multi-modal transformers 2) meta-learning systems such as MAML, 3) GANs of all varieties, such as image-conditional GANs used for image translation, super-resolution, in-filling, domain-transfer, 4) classifiers incorporating any of the modern architecture building blocks, 5) adversarial attacks and defences, 6) state of the art machine translation systems utilizing LSTMs and transformers 7) Multi-sample, multi-parameter-set layers (https://github.com/pytorch/pytorch/issues/17983.*

Research, *Experienced deep learning researcher with a focus on large-scale multi-modal learning and meta-learning. I like to draw insights by actively working on different deep learning subfields, and then leveraging my across-task insights on task-specific projects. I have conducted/collaborated research on well over 65 separate projects in different subfields of deep learning. I have supervised 56 student groups working on deep learning projects, 3 of which were finalists (top-2 in the yearly MLP course competition for the IBM prize.*

Cloud Technologies and Large Scale Machine Learning, *I have 2 years experience of using Google cloud in conjunction with Docker and Kubernetes, to train large-scale multi-modal machine learning systems. I have generally been using Google Cloud infrastructure, including GPU machines, managing disks, images and snapshots, building, maintaining and using Kubernetes clusters, and building and maintaining docker images. Furthermore, I have experience with the nuances of getting models to train efficiently on such large-scale settings, both at the hardware and software levels, as well as the time and cost levels..*

Engineering

General Engineering Skills, *Control and Systems Engineering, Engineering Mathematics.*

Electronics Engineering Skills, *Digital Electronics Engineering, Advanced Electronics Theory Knowledge, Signal Processing, Hardware Design, Integrated Circuit Engineering.*

Software Engineering Skills, *Distributed Systems Development: Java RMI, JGroups, P2P, ReST, LoST, ChordNodes, Networks Programming Knowledge and Experience.*

Embedded Systems Engineering, *Experience programming low level platforms such as Arduino, Raspberry Pi, PIC microcontrollers, ARM based micro-controllers and Android.*

Operating Systems, *Windows 7, Windows 8, Windows 10, Ubuntu Linux, Mac OS, Unix.*

Languages

English	**Proficient**	
Greek	**Native**	
Japanese	**Basic**	*Passive usage mostly, picked up from watching 550+ Anime shows*

Teaching

Sept. 2017 to Current	**Machine Learning Practical Course**, *Teaching Assistant, Group Tutor (Effectively Research Supervisor), Demonstrator and Piazza Instructor*, Full Description at https://www.antreas.io/teaching/.
Apr. 2015 to May 2015	**Digital Innovation**, *Teaching Assistant.*

Open Source and Democratization of Machine Learning Research

I deeply believe that humanity is a paradoxical species, one that relies on single individuals that have the ambition and talent to lead and inspire others, yet, can only truly achieve things as a collective. This is especially the case in research. For any single one of us to be able to do our sane best on any given day and yet have the protection of being kept in check by others via feedback, collaboration, communication and discourse, the only way forward is through as much collaboration as possible, but while trying to keep the balance of individual efficiency and collective effectiveness.
Within that context open source research in the form of public papers, and code, at the very least, and public-facing and interactive research at best.
But more than that, I just intuitively gravitate towards open source and democratization as much as possible, which is why I have been an active and avid open source contributor both for my own work, as well as open-source teaching courses, as well as actively trying to improve existing frameworks that we all love and use. These can be found on my GitHub `https://github.com/AntreasAntoniou`: **a.** Of special

note is "How to train your MAML" a paper and framework that clarifies further how the popular MAML meta-learning framework worked, as well as provides practical and effective solutions to make what was a very interesting but unstable system, into a very stable system that is available for anyone to modify and use, and **b.** minimal-ml-template which is a machine learning template that incorporates my favourite stack, as well as easy support for docker and Kubernetes, so that others won't have to spend a year building a reliable template for scalable and adaptable research that just works.

References

[1] Alessandro Fontanella et al. "ACAT: Adversarial Counterfactual Attention for Classification and Detection in Medical Imaging". In: *ICML* (2023).

[2] Adam Jelley et al. "Contrastive Meta-Learning for Partially Observable Few-Shot Learning". In: *ICLR* (2023).

[3] Antreas Antoniou. "Meta learning for supervised and unsupervised few-shot learning". In: *The University of Edinburgh* (2021).

[4] Timothy Hospedales et al. "Meta-learning in neural networks: A survey". In: *IEEE TPAMI* (2021).

[5] Antreas Antoniou et al. "Defining benchmarks for continual few-shot learning". In: *Meta-Learrning Workshop, NeurIPS*. 2020.

[6] Antreas Antoniou, Harrison Edwards, and Amos Storkey. "How to train your MAML". In: *ICLR*. 2019.

[7] Antreas Antoniou and Amos Storkey. "Assume, Augment and Learn: Unsupervised Few-Shot Meta-Learning via Random Labels and Data Augmentation". In: *arXiv preprint* (2019).

[8] Antreas Antoniou and Amos J Storkey. "Learning to Learn by Self-Critique". In: *NeurIPS*. 2019.

[9] Antreas Antoniou et al. "Meta-meta-learning for Neural Architecture Search through arXiv Descent". In: *Proceedings of the ACH Special Interest Group on Harry Queue Bovik (SIGBOVIK)* (2019).

[10] Antreas Antoniou, Amos Storkey, and Harrison Edwards. "Data Augmentation Generative Adversarial Networks". In: *ICANN* (2018).

[11] Antreas Antoniou et al. "Dilated Densenets for Relational Reasoning". In: *arXiv preprint* (2018).

[12] Luke N Darlow et al. "CINIC-10 is not ImageNet or CIFAR-10". In: *arXiv preprint* (2018).

[13] Antreas Antoniou and Plamen Angelov. "A general purpose intelligent surveillance system for mobile devices using deep learning". In: *IJCNN*. IEEE. 2016.