Thomas Lucas

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Education

PhD student – machine learning and computer vision Inria
Deep generative models of natural images, supervised by Jakob Verbeek and Karteek Alahari 2016-2020

- Deep generative models of natural images, using both adversarial and maximum-likelihood based approaches.
- Image captioning with attention mechanisms, project involving natural language processing and computer vision.
- Work carried out at Inria Grenoble in team Thoth (formerly team Lear) and financed by a ministerial grant.
- It has resulted into publications at ICCV, ECML, ICML and NeurIPS which are detailed below.

Research masters Ensimag & UJF
Machine learning and data science 2015–2016

- Courses focused on machine learning, data-science, statistics and optimization.
- Joint master between Université Joseph Fourier (UJF) and Ensimag, in Grenoble.

Engineering degree Ensimag
Applied mathematics and informatics 2013–2016

- Equivalent to a master of science in computer science, at Ensimag, Grenoble.
- Courses include: inferential statistics, convex optimisation, parallel programming, cryptography.

Classes préparatoires aux grandes écoles Lycee Victor Hugo
Maths and physics (MP)* 2010–2013

- Preparation for competitive national entrance exams for French leading schools.

Other experiences

Research internship at Facebook AI research
Unsupervised representation learning from videos January – May 2020

- Unsupervised representation learning from videos, using generative models trained for future frame prediction.
- Supervised by Piotr Bojanowski; in collaboration with Camille Couprie, Nicolas Ballas, Jure Zbontar and Yann LeCun.

Research internship at Inria
Recurrent models and attention for Image captioning February – July 2016

- Exploration of deep neural architectures and attention mechanisms, applied to image captioning tasks.
- In team Lear, Grenoble, supervised by Jakob Verbeek and Cordelia Schmid. Results were published at ICCV'17.

Summer Engineering Internship
Machine learning on smartphones June – August 2015

- Proof of concept for the start-up situ8ed, under the supervision of James Crowley.
- Leveraging data from smartphone sensors to predict the context of usage (location, activity).
- Project coded on Android.

Peer reviewing since 2018
Conferences: NeurIPS('18,'19), ICLR'18, ICCV'19, AISTATS'20, ICML'19
Journals: IJCV'19, PAMI'19, PAMI'20, IJCV'20

Reading group organisation 2016-2019
I was the organiser of a weekly reading group, about deep-learning and computer vision.

Tutor
In maths, english and physics, for high-school students 2012-2016

Awards

Outstanding reviewer
For the NeurIPS'19 conference, held in Vancouver 2019

Ministerial research grant
Competitive recruitement to obtain a ministerial grant 2016
Given by the doctoral school of Université Grenoble-Alpes (UGA) to finance my PhD. Twenty such grants are issued per year, for all fields of applied maths combined.

Lectures

Nordic Probabilistic AI School

Lecture on deep generative modelling 2019

I gave two lectures at a summer school, of two hours each, one an introduction to deep learning and generative modelling followed by an other on advanced concepts. Given at the Nordic probabilistic AI school (ProbAI) in Trondheim, Norway. Video link: www.youtube.com/channel/UCcMwNzhpePJE3xzOP_3pqsw

Publications

Adaptive density estimation for generative models **NeurIPS 2019 (spotlight)**

Thomas Lucas, Konstantin Shmelkov, Karteek Alahari, Cordelia Schmid and Jakob Verbeek

A learned target space allows hybrid adversarial and maximum-likelihood training of generative models.
Paper link: hal.archives-ouvertes.fr/hal-02007787/file/main.pdf. Spotlight acceptance rate: 3%.

Mixed batches and symmetric discriminators for GAN training **ICML 2018 (long oral)**

Thomas Lucas, Corentin Tallec, Jakob Verbeek and Yann Ollivier

Building a discriminator that can explicitly evaluate sample variety to avoid mode collapse.
Paper link: arxiv.org/pdf/1806.07185.pdf. Long oral acceptance rate: 5 %.

Auxiliary guided autoregressive variational autoencoders **ECML 2018 (oral)**

Thomas Lucas and Jakob Verbeek

Building a model with latent variables and a flexible autoregressive decoder while avoiding posterior collapse.
Paper link: hal.inria.fr/hal-01652881/document. Submission in the top 10 %.

Areas of attention for image captioning **ICCV 2017 (poster)**

Marco Pedersoli, Thomas Lucas, Cordelia Schmid and Jakob Verbeek

Using attention mechanisms, based on region proposals or transformers, to attend relevant regions while captioning.
Paper link: arxiv.org/pdf/1612.01033.pdf

Skills

Programming: Python, Pytorch, Tensorflow, Theano, Java, C/C++

Tools: Vim, Latex, Unix, Bash, Inkscape

Languages

French: Native language

English: Bilingual

German: Basics

Interests

Sports: Volleyball (competitive), ski, tennis

Others: Technology, video games