

## Education

- 2021–2024 **University College London, PhD**, Quantum Computing.  
**Supervisor:** Dan Browne  
PhD student in Dan Browne's group, working on quantum error-correcting codes
- 2020–2021 **University College London, Master of Research**, Quantum Technologies.  
Master of Research (MRes) funded by the Center for Doctoral Training (CDT) in Delivering Quantum Technologies.  
Thesis: *Tailoring 3D topological codes and decoders to biased noise*
- 2017–2019 **KTH Royal Institute of Technology, Master of Science**, Theoretical Physics.  
Double-degree with my engineering's school. I took courses in particle physics, statistical physics, general relativity, quantum computing, dynamical systems, and algebraic topology.  
Thesis: *Learning quantum state properties with quantum and classical neural networks*
- 2015–2017 **ENSTA Paris, Engineering's degree**, Applied Mathematics.  
One of the top French "Grandes Écoles". I took courses in applied mathematics (statistics, optimization, numerical methods, functional analysis) and physics (quantum physics, relativity, statistical physics, fluid/solid mechanics, plasma).
- 2013–2015 **Lycée Henri IV, Preparatory Class**, Mathematics and Physics.  
A French specific two years' undergraduate program leading to a nation-wide competitive examination into a "Grande École", one of the top French engineers school system. Henri IV: Top 3 preparatory classes.

## Research Experience

- June–Sept. 2020 **Summer Student**, Los Alamos National Laboratory, Los Alamos, New Mexico, US.  
**Advisors:** Marco Cerezo and Patrick Coles  
Student and researcher at the Quantum Computing Summer School organized by LANL. Resulted in a paper: *Absence of Barren Plateau in Quantum Convolutional Neural Networks*
- March–May. 2020 **Research Assistant**, DTU Technical University of Denmark, Copenhagen, Denmark.  
**Advisor:** Lars Kai Hansen  
I worked on two projects in the computer science department of DTU: federated learning for EEG data and thermal state preparation with noisy quantum circuits
- June–Dec. 2019 **Machine Learning Scientist**, IQBit, Vancouver and Waterloo, Canada.  
**Advisor:** Pooya Ronagh  
Member of the Hardware Innovation Lab, a research team that explores how future quantum devices can be leveraged to solve practical industrial problems. I designed reinforcement learning algorithms to control nonstochastic quantum annealers. Summer in Vancouver and Fall in Waterloo.
- Oct. 2018 - May 2019 **Visiting Graduate Student**, University of Toronto, Toronto, Canada.  
**Advisors:** Peter Wittek (University of Toronto) and Nathan Killoran (Xanadu).  
Internship in the context of my master's thesis, I worked on learning quantum state properties with quantum neural networks (for both continuous and discrete states)
- July–Sept. 2018 **Research Engineer**, University of Liège, Liège, Belgium.  
**Advisor:** Gilles Louppe.  
I worked for the summer on deep learning and meta-learning methods for likelihood-free inference. Resulted in a publication at the *NeurIPS 2018 Workshop on Meta-Learning*.
- Sept. 2017 - June 2018 **Research Assistant**, KTH Royal Institute of Technology, Stockholm, Sweden.  
**Advisor:** Hossein Azizpour  
Research assistantship in *Robotics, Perception and Learning (RPL)* lab. I worked on benchmarking adversarial domain adaptation methods.
- June - Aug. 2017 **Summer Student**, CERN, Geneva, Switzerland.  
**Advisors:** Benoît Salvant and Nicolo Biancacci  
Member of the CERN Summer Student Program, I contributed to the development of a new model of instability inside particle accelerators.
- Sept. 2015 - June 2017 **Research Assistant**, Université Paris-Saclay, Orsay, France.  
**Advisor:** Isabelle Guyon  
I worked on domain adaptation with High Energy physics datasets. I developed a software that enables to test and visualize domain adaptation algorithms on toy datasets.

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## Teaching

- Jan. 2020 **PSI Winter School**, *Perimeter Institute*.  
Supervised a project on the loss landscape of variational circuits with three master students and two post-docs, at a Winter School organized by the Perimeter Institute.
- Oct. 2018 - **Quantum Machine Learning MOOC**, *University of Toronto*.
- May 2019 Teaching Assistant for the QML MOOC (available on EdX) made by Peter Wittek. I wrote some of the lecture notebooks and helped answering questions on the forum.
- March - May **Deep Learning in Data Science (DD2424)**, *KTH Royal Institute of Technology*.  
2018 Teaching Assistant for the deep learning master's course at KTH. I helped students with their projects and homework and was in charge of setting up Google Cloud Platform for the course.
- July - Aug. **AutoML Hackathons**, *ChaLearn*.  
2015 Teaching assistant for the non-profit organization ChaLearn during two hackathons on automatic machine learning (AutoML). One was in Saint-Petersburg, at the *Machine Learning and Intelligence School* and the other in Stanford at the *INNS Conference on Big Data*. I wrote the starting kit for the challenge and helped the participants during the hackathons

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## Papers

- 2020 **A. Pesah**, M. Cerezo, S. Wang, T. Volkoff, A.T. Sornborger, P.J. Coles, *Absence of Barren Plateaus in Quantum Convolutional Neural Networks*, Physical Review X
- 2020 W. Guan, G. Perdue, **A. Pesah**, M. Schuld, K. Terashi, S. Vallecorsa, J. Vlimant, *Quantum Machine Learning in High Energy Physics*, Machine Learning: Science and Technology
- 2018 **A. Pesah**, A. Wehenkel, G. Louppe, *Recurrent Machines for Likelihood-free Inference*, NeurIPS 2018 Workshop on Meta-Learning

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## Articles

- 2018 A. Pesah and A. Wehenkel, *Improve your scientific models with meta-learning and likelihood-free inference*, Towards Data Science
- 2018 A. Pesah, *Recent Advances for a Better Understanding of Deep Learning*, Towards Data Science
- 2018 A. Pesah, *A Little Review of Domain Adaptation in 2017*, Personal Website

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## Talks

- 2020 A. Pesah, *Quantum Machine Learning Beyond the Hype*. Talk given in different research seminars: IRISA (CNRS), France and DTU Compute, Denmark. Slides on my website
- 2019 A. Pesah, *A Gradient-based Method for Controlling Adiabatic Trajectories*. IQC Student Seminar, University of Waterloo, Canada
- 2018 A. Pesah and A. Wehenkel, *Recurrent Machines for Likelihood-free Inference*, Contributed talk at the NeurIPS 2018 Workshop on Meta-Learning. Slides on my website
- 2018 M. Sebag and A. Pesah, *Representation Learning, Domain Adaptation and Generative Models with Deep Learning*, 2nd International Summer School on Deep Learning 2018. I gave the last part of the course, on adversarial domain adaptation.
- 2018 A. Pesah, *Introduction to domain adaptation*. Talk given during a Stockholm AI meetup and the AI week organized in the city. Slides on my website.

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## Grants and Awards

- 2019 **Mitacs Globalink Research Award**, 6,000 CAD.  
Canadian grant received for my master's thesis internship at the University of Toronto
- 2017 **ENSTA Best Research Project Award**, 2nd position, 1,000€.  
Award received for my research internship at CERN during the Summer 2017. Competition organized by ENSTA ParisTech to gratify the best research summer internships. Students are judged by a dozen researchers of the school on a 50-pages report, the comments of the supervisor and a 3 minutes presentation. 16 students are selected in the first phase (among the whole cohort consisting in 150 students) and 3 prizes are awarded at the end.

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## Community service

## Reviewer for journals and conferences.

- *PRX Quantum*, American Physical Society
- *Journal of Physics Communication*, IOP Publishing
- *Machine Learning and the Physical Sciences 2019 workshop*, NeurIPS 2019

2021 **Program Committee Member**, *6th International Conference for Young Quantum Information Scientists*, Michigan State University, April 2021.

Helping in the organization of the conference (reviewing, chairing sessions, finding invited speakers, etc.)

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## Other activities

2016 **Science outreach**, *Bouge la Science*, Supelec, Gif-sur-Yvettes.

Popularized scientific experiments to junior high school students during a scientific festival in the engineering school Supelec.

2016 **Science outreach**, *Palais de la Decouverte*, Paris.

Volunteered to present some physics experiments to a general public at a science museum in Paris

2015 **French selection for the International Physicists Tournament (IPT)**, *3rd place*.

Member of the ENSTA team, I participated to the national selection of the IPT. We worked on open physics problems during 4 months and presented models and experiments in front of a jury.

2015 **Founder and President**, *DaTA - ENSTA Computer Science Club*, Palaiseau.

Founder of my engineering's school computer science club. We organized formations (web development, GitHub, machine learning, etc.), helped students and professors with their computer problems, and made projects together

2015 **Co-Founder**, *GraviTation - ENSTA Physics Club*, Palaiseau.

Co-Founder of my engineering's school physics club. We organized the International Physicists Tournament preparation in our school, as well as some seminars and science outreach events

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## Skills

Langages	Python, C/C++, JavaScript, Julia, R, Matlab
ML Libraries	Tensorflow, PyTorch, Keras, Scikit-Learn
Quantum Libraries	Qiskit, Cirq, PyQuil, PennyLane, Strawberry Fields, Yao
Web Framework	D3.js, Three.js