

# Aram Davtyan

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## Education

- Sep 2020 – present **Ph.D. in Computer Science**, *University of Bern, Computer Vision Group*, Bern, Switzerland.  
Research topic: Learning Object Interactions, Controllable Video Generation, World Models.  
Supervisor: **Prof. Dr. Paolo Favaro**
- Sep 2014 – Jun 2020 **B.S. + M.S. equivalent (with honors) in Mathematics**, *MSU*, Moscow, Russia, GPA 4.98/5.  
Thesis: Spectral analysis of the operator in the generalized 't Hooft model.  
Supervisor: **Prof. Dr. Igor Sheipak**
- Sep 2016 – Jun 2018 **M.S. equivalent in Data Analysis**, *Yandex School of Data Analysis*, Moscow, Russia.  
Thesis: Optimization of oil production via forecast models on injection wells operation modes.  
Supervisor: **Prof. Dr. Ilya Muchnik**

## Winter and Summer Schools

- Jul 2023 **Attendee**, *International Computer Vision Summer School*, Sicily, Italy.  
Intense one-week summer school with more than 100 participants and lectures delivered by world renowned experts in the field of computer vision.
- Feb 2020 **Attendee**, *Winter School "Math of machine learning"*, Sochi, Russia.  
Four-day workshop consisting of 3 interdisciplinary mini-courses on theoretical foundations of machine learning and deep learning delivered by world-class scientists.

## Job Experience

- Feb 2019 – Sep 2020 **Software Engineer**, *Yandex*, Moscow, Russia.
- Developing the backend of Yandex.Navigator, a high-load service responsible for building optimal routes in the automobile graph with respect to the realtime traffic.
  - Solved various tasks for maintaining the service, from building data acquisition pipelines to enhancing data quality and developing (sub)optimal route proposal algorithms on road graphs.
  - Significantly improved the quality of the suggested routes via supervised and reinforcement learning techniques.
- Sep 2017 – Dec 2021 **ML Specialist**, *Inline group*, Moscow, Russia.
- Solved various tasks on ML applications in oil industry, involving forecasting oil production rates and building statistical graphs of relationships between different type of wells.
  - Collecting and preprocessing data, negotiating and presenting solutions to the customers.

## Selected Publications

- Mar 2023 **Learn the Force We Can: Multi-Object Video Generation from Pixel-Level Interactions**, *arXiv preprint*.  
**Aram Davtyan** and Paolo Favaro.  
[\[paper\]](#) [\[website\]](#) [\[github\]](#)
- Nov 2022 **Efficient Video Prediction via Sparsely Conditioned Flow Matching**, *ICCV 2023*.  
**Aram Davtyan**, Sepehr Sameni, Paolo Favaro.  
[\[paper\]](#) [\[website\]](#) [\[github\]](#)
- Mar 2022 **Controllable Video Generation through Global and Local Motion Dynamics**, *ECCV 2022*.  
**Aram Davtyan** and Paolo Favaro.  
[\[paper\]](#) [\[website\]](#) [\[github\]](#)

- Feb 2021 **KOALA: A Kalman Optimization Algorithm with Loss Adaptivity**, *AAAI 2022*.  
**Aram Davtyan**, Sepehr Sameni, Llukman Cerkezi, Givi Meishvili, Adam Bielski, Paolo Favaro.  
[\[paper\]](#) [\[website\]](#) [\[github\]](#)
- Mar 2020 **Oil Production Forecast Models Based on Sliding Window Regression**, *Journal of Petroleum Science and Engineering 2020*.  
**Aram Davtyan**, Alexander Rodin, Ilya Muchnik, Alexey Romashkin.  
[\[paper\]](#)
- Oct 2019 **Control Method of Oil Production at Mature Separate Oil Deposit**, *Patent, RU2701761C1*.  
**Aram Davtyan**, Alexey Romashkin, Muchnik Ilya.  
[\[url\]](#)

## Talks

- Sep 2023 **Efficient Video Prediction via Sparsely Conditioned Flow Matching**, *Heidelberg, Germany*.  
Nectar Track Oral Presentation, GCPR 2023.

## Teaching Experience

- Spring 2023 **Teching Assistant**, *University of Bern*, Bern, Switzerland.  
“Deep Learning” (M.S. level) course taught by **Prof. Dr. Paolo Favaro**
- Fall 2022 **Teching Assistant**, *University of Bern*, Bern, Switzerland.  
“Machine Learning” (B.S. level) course taught by **Prof. Dr. Paolo Favaro**
- Fall 2021 **Teching Assistant**, *Yandex School of Data Analysis*, Moscow, Russia.  
Seminar on Self-Supervised learning in Computer Vision for the “Machine Learning” course.
- Fall 2021 **Teching Assistant**, *University of Bern*, Bern, Switzerland.  
“Machine Learning” (B.S. level) course taught by **Prof. Dr. Paolo Favaro**
- Spring 2021 **Teching Assistant**, *University of Bern*, Bern, Switzerland.  
“Advanced Topics in Machine Learning” (M.S. level) course taught by **Prof. Dr. Paolo Favaro**
- Fall 2020 **Teching Assistant**, *University of Bern*, Bern, Switzerland.  
“Machine Learning” (B.S. level) course taught by **Prof. Dr. Paolo Favaro**
- Sep 2018 – Dec 2021 **Supervisor**, *Yandex School of Data Analysis*, Moscow, Russia.  
Supervised a group of students in their research in statistical methods applied to the oil industry.

## Skills

- Coding C/C++, Python
- ML/DL libs numpy, pandas, matplotlib, sklearn, PyTorch, torchvision, TensorFlow
- Other SVN, git, SQL, MapReduce, Wolfram Mathematica,  $\text{\LaTeX}$
- Math Functional Analysis, Probability Theory, Statistics

## Other Achievements

- Mar 2018 **Changellenge CupIT Data Science section**, *1st place*, Moscow, Russia.
- Fall 2016 **Lomonosov MSU VII Annual Conference for Students in English**, *2nd place*, Moscow, Russia.
- Spring 2015 **University Olympiad in Topology and Differential Geometry**, *Prize*, Moscow, Russia.
- Spring 2014 **Russian Olympiad in Physics Finals**, *Top-200 in Russia*, Saint-Petersburg, Russia.

## Languages

- English Fluent
- German Intermediate
- Russian Native language
- Armenian Mother tongue