Artem Pulkin

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🌐 pulk.in

🏠 Amsterdam NL 🇳🇱

Expertise

Numerical and data science, machine learning, research code development

Education 🎓

Docteur ès Sciences EPFL in physics Lausanne CH 🇨🇭 Specialized on: numerical electronic structure, quantum simulations. Thesis: Electronic Transport in 2D Materials with Strong Spin-orbit Coupling (03/2017); supervisor: Oleg Yazyev — 2012-2017

Master of Science Chalmers in applied physics Göteborg SE 🇸🇪 Thesis: Spintromechanical Aspects of Charge Transport in Nanostructures (06/2012); supervisor: Robert Shekhter — 2010-2012

B.Sc. in Physics cum laude V.N. Karazin's State University Kharkiv UA 🇺🇦 — 2006-2010

Training

Coursera: Machine Learning from Stanford University

Experience 🔬

Postdoc @ QuTech Delft university of technology NL 🇳🇱 — Apr'19-Apr'22

I researched a stack of machine learning tools: deep neural networks DNN, generative models (reverse Monte-Carlo, RMC), adversarial attack approaches in the context of electronic structure/nanoscale atomic dynamics. I developed a DNN/atomic descriptor code for nanoscale dynamics miniff. I used python to investigate large material datasets to find novel electronic structure effects.

Postdoc @ Caltech US 🇺🇸 — Jul'17-Mar'19

I developed and implemented a computational many-body quantum chemistry framework to model two-dimensional crystalline materials. I investigated low-energy spectral properties of two-dimensional molybdenum disulphide with numerical modeling using massive computational infrastructure.

Doctoral assistant @ EPFL CH 🇨🇭 — Oct'12-Apr'17

I carried out a scientific project in the quantum materials modelling domain. I discovered a new class of electronic band structure effects in two-dimensional semiconductors. I collaborated with world-leading experimental groups to prove my findings experimentally.

Research assistant @ Seoul National University, KR 🇰🇷 — Jun'12-Aug'12

Research assistant @ Chalmers, SE 🇸🇪 — Aug'10-Jun'12

Achievements

15 publications **>500** citations **14** talks

>10 countries visited (work, conferences, collaborations)

>30 collaborators

Awards 🏆

💰 Personal **Swiss NSF grant** to study abroad 80k CHF, 18 months, postdoctoral level (Early Postdoc.Mobility) grant P2ELP2_175281 — postgraduate

💰 Personal computing time at **national supercomputing facilities (SURF NL)** Approximate equivalent of 26k EUR, 24 months project 45873

🏅 Olympiad in Physics for University Students (national in Ukraine) – **first prize** — graduate

🏅 **Youth Physicists Tournament** (national in Ukraine, team) – multiple prizes

🏅 Open Olympiad in Applied Physics (MIPT Moscow) – **first prize**

💰 Kharkiv City Mayor and Kharkiv State Governor scholarships for gifted youth

🏅 Dozens of prizes in physics and informatics (olympiads, student projects; **top-10 and top-1 in national competitions**) — high school

💰 Multiple scholarships

Skills 🔨

Data science: statistical analysis, processing, automation, visualization.

Machine learning: supervised learning (DNN, linear fits, logistic fits, SVM); unsupervised learning (PCA/SVD, K-means, anomaly detection); dataset generation, feature extraction, adversarial models.

Software development in 🐍 Python (7 years): scientific stack: numpy, torch, matplotlib, pandas; notebooks; HPC and parallel/distributed/concurrent computing (MPI, OpenMP, multiprocessing, async); performance-driven development with C and cython.

Other: C, ☕ Java, Fortran, Julia, Javascript, Matlab, C++.

Soft skills: critical analysis, problem solving, communicating (organizing discussions, presenting, documentation writing), full-cycle project management (idea - resources - implementation - reporting), supervision.

Languages

English (prof), Ukrainian (mother), Russian, French (basic), Dutch (basic).

Hobbies

Sports, ✈ travels, cross-stitching, soldering, 🔒 lock picking, 🕹 board and video games, open-source projects.