Axel Levy

axlevy.com| axlevy@stanford.edu | linkedin.com/in/axel-levy-x17

Education

Stanford University 2020 - 2025
Ph.D. Electrical Engineering
- Efficient Machine Learning Algorithms for Protein Structure Determination with Cryo-EM
- Areas: AI for science, generative AI, protein structure determination, 3D reconstruction

Ecole Polytechnique 2017 - 2020
Grandes Ecoles Program / Ingénieur Polytechnicien
- Areas: statistical mechanics, quantum physics

Lycée Sainte-Genevieve 2015 - 2017
MP - PSI*
- Areas: maths, physics, engineering sciences

Research and Work Experience

Generate Biomedicines - Machine Learning Research Scientist 2025 - Present
Somerville, Massachusetts
- AI for drug discovery
- Frontier generative models for biomolecular data
- Lead on the development of our active learning loop, connecting experimental data to model training
- Joined pre-IPO

Generate Biomedicines - Machine Learning Intern Jun 2024 - Sep 2024
Somerville, Massachusetts
- De novo protein generation with diffusion models, structure determination
- *Advisor: Dr. John Ingraham, Dr. Eugene Palovcak, Dr. Maxwell Zimmerman*

Google Brain - Research Scientist Intern Jun 2022 - Sep 2022
Mountain View, California
- Inverse rendering, neural rendering
- *Advisor: Dr. Dmitry Lagun (SynthX team)*

SLAC National Lab + Stanford Computational Imaging Lab 2021 - 2025
Stanford, California
- *Advisors: Prof. Mike Dunne (LCLS), Prof. Gordon Wetzstein (SCI)*

University of Sheffield - Visiting Researcher Mar 2020 - Jul 2020
Sheffield, UK (remote)
- Reservoir computing, neuromorphic computing, quantum materials
- *Advisor: Prof. Tom Hayward, Dr. Alex Welbourne*

ONERA - The French Aerospace Lab Sep 2019 - Mar 2020
Palaiseau, France
- Random matrices theory, diffusion theory
- *Advisors: Dr. Jean-Philippe Ovarlez, Dr. Eugenie Terreaux*

Polytechnique Scientific Group Project Sep 2018 - Jun 2019
Palaiseau, France
- Built a quantum remote laboratory in a group of 5 students
- `https://fentes-young-photon-exp.binets.fr/index.php`
- *Advisors: Prof. Emmanuel Joffre, Prof. Daniel Suchet*

Stereolabs - Optoelectronic Engineering Intern Jun 2019 - Aug 2019
Paris, France

- 3D stereo-imaging, optics, electronics
- Start-up of 15 people
- *Advisor: Dr. Edwin Azzar*

Air Force Officer 2018
Noumea, New Caledonia

PUBLICATIONS

CryoDRGN-AI: Neural *Ab Initio* Reconstruction of Challenging Cryo-EM and Cryo-ET Datasets 2025
Levy A., *Raghu R., Feathers R., Grzadkowski M., Poitevin F., Johnston J., Vallese F., Clarke O., Wetzstein G., Zhong E.*
Nature Methods - `link`

Multiscale Guidance of AlphaFold3 with Heterogeneous Cryo-EM Data (CryoBoltz) 2025
Raghu R., ***Levy A.***, *Wetzstein G., Zhong E.*
NeurIPS - `link`

Scalable 3D Reconstruction for X-Ray Single Particle Imaging Based on Online Machine Learning 2025
Shenoy J., ***Levy A.***, *Ayyer K., Poitevin F., Wetzstein G.*
Nature Communications

Mixture of Neural Fields for Heterogeneous Reconstruction in Cryo-EM 2024
Levy A., *Raghu R., Shustin D., Peng A., Li H., Clarke O., Wetzstein G., Zhong E.*
NeurIPS - `link`

Towards Interpretable Cryo-EM: Disentangling Latent Spaces of Molecular Conformations 2024
Klindt D., Hyvärinen A., ***Levy A.***, *Miolane N., Poitevin F.*
Frontiers in Molecular Biosciences - `link`

MELON: NeRF with Unposed Images in SO(3) 2023
Levy A.*, *Matthews M.**, *Sela M., Wetzstein G., Lagun D.*
3DV **Spotlight** - `link`

GeNVS: Generative Novel View Synthesis with 3D-Aware Diffusion Models 2023
*Chan E.**, *Nagano K.**, *Chan M.**, *Bergman A.**, *Park J.J.**, ***Levy A.***, *Aittala M., De Mello S., Karras T., Wetzstein G.*
ICCV **Oral** - `link`

Amortized Inference for Heterogeneous Reconstruction in Cryo-EM 2022
Levy A., *Wetzstein G., Martel J., Poitevin F., Zhong E.*
NeurIPS - `link`

Heterogeneous reconstruction of deformable atomic models in Cryo-EM 2022
Nashed Y., Peck A., Martel J., ***Levy A.***, *Koo B., Wetzstein G., Miolane N., Ratner D., Poitevin F.*
NeurIPS Workshops - `link`

CryoAI: Amortized Inference of Poses for *Ab Initio* Reconstruction of 3D Molecular Volumes from Real Cryo-EM Images 2022
Levy A., *Poitevin F., Martel J., Nashed Y., Peck A., Miolane N., Dunne M., Wetzstein G.*
ECCV - `link`

Deep Generative Modeling for Volume Reconstruction in Cryo-Electron Microscopy 2022
Donnat C., ***Levy A.***, *Poitevin F., Zhong E., Miolane N.*
Journal of Structural Biology - `link`

Voltage-controlled superparamagnetic ensembles for low-power reservoir computing 2021
Welbourne A., ***Levy A.*** *, Ellis M. , Chen H., Thompson M., Vasilaki E. , Allwood D. , Hayward T.*
Applied Physics Letters - `link`

Talks

PhD Defense (Stanford University, Stanford) `recorded` 2025
Guest Lecture (*Laura Waller*, UC Berkeley, Berkeley) 2024
SLAC Users' Meeting (SLAC, Menlo Park) 2024
Guest Lecture (*Gordon Wetzstein*, Stanford University, Stanford) 2024
SCIEN Seminar (Stanford University, Stanford) `recorded` 2023
CECAM Workshop (EPFL, Lausanne) 2023
Invited Talk (*Slavica Jonic*, IMPMC, Paris) 2023
Invited Talk (*Michael Unser*, EPFL, Lausanne) 2023
Invited Talk (*George Drettakis*, INRIA, Sophia-Antipolis) 2023
Invited Talk (Google, Mountain View) 2023
Invited Talk (*Vincent Sitzmann*, MIT, Cambridge) 2023
SLAC Public Lecture (SLAC, Menlo Park) `recorded` 2023
Invited Talk (*Ellen Zhong*, Princeton University, Princeton) 2022
Invited Talk (*Pilar Cossio*, Flatiron Institute, NYC) 2022
Invited Talk (*Sylvain Gigan*, ENS, Paris) 2022
SLAC AI Seminar (SLAC, Menlo Park) 2022
PIMS Workshop (UBC, Vancouver) 2022
4th International Symposium on Cryo-3D Image Analysis (Tahoe) 2022

Awards and Fellowships

Google Conference Scholarship 2024
Pacific Institute for the Mathematical Sciences Travel Award 2022
SGF: Stanford Graduate Fellowship in Engineering 2020
French Academy of Sciences Prize (awarded for scientific work at Ecole Polytechnique) 2021
Best Scientific Group Project Prize (awarded to 3 groups out of 120) 2020

Academic Service

Reviewer, European Conference on Computer Vision (ECCV) 2024
Reviewer, Neural Information Processing System (NeurIPS) 2023, 2024, 2025
Reviewer, NeurIPS Workshop on Machine Learning for Structural Biology (MLSB) 2023, 2024
Reviewer, International Conference on Computer Vision (ICCV) 2023
Reviewer, Conference on Computer Vision and Pattern Recognition (CVPR) 2022, 2024
Reviewer, PLOS Computational Biology 2022

Teaching Experience

Course Assistant - Computational Imaging 2023 - 2024
Instructor: Pr. Gordon Wetzstein (Stanford University)

Course Assistant - Semiconductor Memory Devices and Circuit Design 2020
Instructor: Pr. Philip Wong (Stanford University)

Teaching Assistant in Preparatory School - Physics 2018 - 2019
Instructor: Pr. Thibaud Naulet (Ecole Sainte-Genevieve)

- Prepared students for a nationwide ranked exam (X/ENS/Centrale/Mines)

SOFTWARE

ADP-3D: `https://github.com/axel-levy/axlevy-adp-3d` 2024

DRGN-AI: `https://github.com/ml-struct-bio/drgnai` 2024

CryoFIRE: `https://github.com/ml-struct-bio/cryofire` 2022

CryoAI: `https://github.com/compSPI/cryoAI` 2022

SKILLS

Languages: English (fluent), French (native), Spanish (intermediate)
Programming: Python, Pytorch, Jax, Tensorflow, C++, Java, Git