QUENTIN BECKER
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APPOINTMENTS

Postdoctoral Researcher, Swiss Federal Institute of Technology Lausanne (EPFL) — Feb '25 to current
Department of Computer Science — Lausanne, CH

EDUCATION

Swiss Federal Institute of Technology Lausanne (EPFL) — Sep '19 to Jan '25
Ph.D in Computer Science – Major in Artificial Intelligence (GPA: 5.4/6.0) — Lausanne, CH

- Relevant courses: Learning Theory, Optimization for Machine Learning, Information Theory, Distributed Information Systems

University of California Berkeley — Aug '17 to Dec '18
Master of Science in Mechanical Engineering – Major in Fluids (GPA: 4.0/4.0) — Berkeley, CA

- Relevant courses: Machine Learning, Optimization Methods, Tensor Calculus, Differential Geometry, Advanced Fluid Mechanics, Ocean Engineering

Institut Supérieur de l'Aéronautique et de l'Espace, Supaéro (ISAE Supaéro) — Aug '15 to Sep '19
Equiv. Bachelor of Science and Master of Science in Aeronautical and Aerospace Engineering ("Ingénieur ISAE Supaéro", GPA: 4.0/4.0) — Toulouse, FR

- Relevant courses: Advanced Probability and Statistics, Computer Science, Continuum Mechanics, Fluid Mechanics

RESEARCH EXPERIENCE

Google Research (Arkadia) — Jun '22 to Sep '22
Research Intern (qbecker@) – Host: Dr. Urs Bergmann (ursbergmann@) — Berlin, DE

- Developed a differentiable geometric primitives composition module (JAX)
- Programmed deep vision models (JAX, TF1, and TF2) that learn to decompose an occupancy mask into primitives
- Implemented optimal transport-based losses to train models to simplify building footprints into primitives (JAX)

EPFL — Sep '19 to Jan '25
Ph.D Candidate – Advisor: Prof. Dr. Mark Pauly — Lausanne, CH

- Introduced and implemented a rationalization algorithm for bending-active structures that optimizes a single kit of parts to approximate many user-defined designs
- Implemented an inverse design pipeline for deployable assemblies of curved elastic beams (C++ with Python bindings)
- Developed a forward design tool based on conformal map for C-shells (Rhino-Grasshopper plugin)
- Designed generative models to solve constrained physics-based inverse problems
- Developed differentiable physics simulation frameworks: billiard game with diverse obstacles (PyTorch), constrained elastic deformations of 3D volumetric objects (C++, PyTorch, and JAX)

Dassault Systèmes — Jan '19 to Jul '19
Research Intern in Machine Learning — Paris, FR

- Developed a clustering algorithm based on hash tables to find geometrically similar 3D parts within a dataset

UC Berkeley — Sep '17 to Dec '18
Graduate Student – Advisor: Prof. Dr. Reza Alam — Berkeley, CA

- Developed an ad hoc genetic algorithm coupled with a boundary element method to optimize underwater vehicles
- Trained a deep neural network to morph an underwater vehicle's shape according to its environment

ISAE Supaéro — Jan '17 to Jul '17
Undergraduate Student – Advisor: Prof. Dr. Laurent Joly — Toulouse, FR

- Coded the method of characteristics for supersonic flows to design nozzles (then validated with CFD)

PUBLICATIONS

Quentin Becker*, Uday Kusupati*, Seiichi Suzuki, Mark Pauly (*joint first authors). Computational Design of a Kit of Parts for Bending-Active Structures. *ACM Transactions on Graphics (Proc. of SIGGRAPH Asia 2024)*, 43.6, article 230 (December 2024): 1-16.

Quentin Becker, Seiichi Suzuki, Mark Pauly. Interactive Design of C-shells Using Reduced Parametric Families. *Journal of the International Association for Shell and Spatial Structures*, Vol. 65 (2024) No. 2 June n. 220.

Quentin Becker, Seiichi Suzuki, Yingying Ren, Davide Pellis, Julian Panetta, Mark Pauly. C-shells: Deployable Gridshells with Curved Beams. *ACM Transactions on Graphics (Proc. of SIGGRAPH Asia 2024)*, 42.6, article 181 (December 2023): 1-17 (**Best Paper Award Honorable Mention**)

Michelis, Mike Yan, and **Quentin Becker**. On Linear Interpolation in the Latent Space of Deep Generative Models. *ICLR 2021 Workshop on Geometrical and Topological Representation Learning*. 2021. (**Spotlight**)

Quentin Becker, Mohammad-Reza Alam, and Alexandre Immas. Hydrodynamic Design of a Morphic Autonomous Underwater Vehicle Using Neural Networks. *ASME 2019 38th International Conference on Ocean, Offshore and Arctic Engineering*. American Society of Mechanical Engineers Digital Collection. 2019.

INVITED TALKS

NVIDIA Toronto AI Lab, "Geometry-Informed Inverse Design of Physical Systems", hosted by Prof. David Levin — February 2025

TEACHING EXPERIENCE

EPFL — Lausanne, CH

Teaching Assistant for CS-457 Geometric Computing — Fall 2021, 2023

- Developed recitations, created theory and coding homework (FEM, autodiff, adjoint sensitivity analysis)

Co-Head Teaching Assistant for CS-341 Introduction to Computer Graphics — Spring 2019, 2020

- Created coding homeworks (raytracing on the GPU), developed and led recitations, supervised coding projects

Teaching Assistant for Math-101 Analysis I and II — Fall 2020, Spring 2021

Teaching Assistant for CS-107 Introduction to Programming — Fall 2022, 2024

UC Berkeley — Berkeley, CA

Graduate Student Instructor (50%) for Physics-8A Introductory Physics — Fall, Spring 2017

MENTORSHIP

Master Thesis

- Orfeas Liassoutos (MS student, EPFL); Topic: Cooperative Geometric Locomoters — Spring 2025

Semester Projects

- Mathilde Simoni (MS student, EPFL); Topic: Neural Subspaces for Symplectic Physical Trajectories — Spring 2024
- Danila Zubko (MS student, EPFL); Topic: Latent Space Physical Simulations — Fall 2023
- Vishal Pani (MS student, EPFL); Topic: Generative Model Evaluation Metric Using Differential Geometry — Spring 2022
- Cosme Jordan (MS student, EPFL); Topic: Generative Inverse Design of Kirigami Sheets — Fall 2021
- Amine Chaouchi (MS student, EPFL); Topic: Unsupervized Disentanglement of Caricatures Generation — Spring 2020
- Mike Jan Michelis (MS student, TUM); Topic: Interpolations in a Generative Model's Latent Space — Fall 2020
- Nathan Greslin (MS student, EPFL); Topic: Body Capture from a Single Image — Fall 2020

Summer Interns

- Janet Qian (BS student, MIT); Topic: Topological Inverse Design of Elastic Springs — Summer 2024
- Jae Yoon (David) Cha (BS student, University of Waterloo); Topic: Elastic Single Axis Joints Simulation — Summer 2023
- Han Ying (BS student, CMU); Topic: Interactive Surface Parameterization — Summer 2021

PROFESSIONAL SERVICE

Reviewing

SIGGRAPH

AWARDS/HONORS

- **Merit Scholarship**, Fondation ISAE SUPAERO — May '17
- **Membership**, Golden Key (GKIHS) — Feb '18

IT SKILLS

Programming: Python (JAX, PyTorch, TF), C++, WebGL, Matlab

Others: LaTeX, Git, Google Internal Coding Infrastructure, Rhino-Grasshopper, Catia, StarCCM+, Fluent

VOLUNTEER EXPERIENCE

- **SUPAERO Junior Conseil – the Junior Entreprise of ISAE SUPAERO**, Head of the event division
- **SUPAERO Fencing Club,** President of the association
- **SUPAERO Student Association,** Section treasurer
- **Ose L'ISAE,** Volunteer in the social outreach section of ISAE SUPAERO

NON-RESEARCH WORK EXPERIENCE

Airbus Saint Eloi — Jun '16 to Jul '16

Intern (laser measurements on engine pylons) — Toulouse, FR