Corentin Dumery

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Profile:
Nationality: French, born in 1998

PhD student in Computer Vision at EPFL
Expected graduation: September 2026

RESEARCH INTERESTS

I am dedicated to advancing machine perception through **3D scene reconstruction and understanding**, enabling machines to not only see their environment but also comprehend and interact with it. My work also emphasizes **3D content creation** for digital AR/VR environments, leveraging both real-world reconstruction and AI-assisted 3D generation.

EDUCATION

PhD Candidate, *EPFL, Computer Vision Lab* 2022 - Today

My current research is supervised by Prof. Pascal Fua and focuses on lifting 2D perceptual models into 3D scenes reconstructed with Gaussian Splatting. Previously, I have also worked on 3D segmentation [5] and image-based reconstruction [3,4].

Master of Computing, *National University of Singapore* 2019 - 2020

Joint degree with Télécom Paris, focused on **3D Vision** and **Machine Learning**. GPA: 4.75/5.0

Master of Engineering, *Télécom Paris (Institut Polytechnique de Paris)* 2017 - 2020

Specialization in **Computer Graphics** and **Operations Research**. GPA: 4.0/4.0

French preparatory classes MPSI/MP*, *Lycée Pothier, Orléans* 2015 - 2017

EXPERIENCE

ETH Zürich | *Research Intern* Oct 2021 - Mar 2022

- Research on **shape modeling** at the Interactive Geometry Lab led by Prof. Olga Sorkine-Hornung
- Finding new ways to use computational geometry techniques to tackle practical fabrication challenges [1]

CEA Paris-Saclay | *Research Engineer (fixed-term)* Mar 2021 - Oct 2021

- Research on **robust hexahedral meshing** for finite-element simulation, supervised by Prof. Franck Ledoux
- Improved polycube labeling using a novel genetic optimization method [2]

Squaremind | *R&D Intern* Jun 2020 - Dec 2020

- Contributed to the **development of a skin scanning robot** for the early detection of skin cancer
- Developed multi-threaded Qt interface that controls robotic arm and camera movements in real-time
- Implemented OpenGL rasterization pipeline to generate large dataset used to train deep learning models

PUBLICATIONS

[1] **Computational pattern making from 3D garment models**. *ACM Transactions On Graphics (SIGGRAPH 22)*. N. Pietroni, **C. Dumery**, R. Falque, M. Liu, T. Vidal-Calleja, and O. Sorkine-Hornung.

[2] **Evocube: a Genetic Labeling Framework for Polycube-Maps**. *Computer Graphics Forum (Invited at Eurographics 2023)*. **C. Dumery**, F. Protais, S. Mestrallet, C. Bourcier, F. Ledoux.

[3] **Garment Recovery with Shape and Deformation Priors**. *CVPR 24*. R. Li, **C. Dumery**, B. Guillard, P. Fua.

[4] **Reconstruction of Manipulated Garment with Guided Deformation Prior**. *NeurIPS 24*. R. Li, **C. Dumery**, Z. Deng, P. Fua.

[5] **DiscoNeRF: Class-Agnostic Object Field for 3D Object Discovery**. *Preprint*. **C. Dumery**, A. Fan, R. Li, N. Talabot, P. Fua.

PROJECTS

Design of Implants for Skull Reconstructive Surgery | *NUS, supervised by Prof. Leow Wee Kheng* 2019 - 2020

- Developed 3D geometry software that generates skull implants from damaged skull meshes
- Collaborated with Osteopore to process real-world data with up to 1 million triangles

- Improved 3D printing process with efficient 3D flattening

B-Mesh Modeller | *Télécom Paris, supervised by Prof. Jean-Marc Thiery* 2019

- Created a novel modelling software for fast mesh prototyping (demo)
- Implemented 3D operations including mesh fairing, convex hulls and mesh stitching
- Developped an application to interactively generate 3D models from Qt interface

Evaluation of a Spectral Data Transformation Method for Semantic Mesh Segmentation | *NUS* 2020

- Evaluated a 3D segmentation method using clustering metrics, analyzed results and concluded on method efficiency

ADDITIONAL EXPERIENCE

EPFL | *Head Teaching assistant* 2023 - Today

- CS433 Machine Learning - Led a team of 30 assistants for a course of 600 students, under the direct supervision of Prof. M. Jaggi and N. Flammarion. The ML course is one of the largest at EPFL and includes over 400 projects. (2023, 2024)
- CS442 Computer Vision - Led 8-10 assistants to create material, teach and evaluate over 190 students. (2023, 2024)

Reviewer | *Computer Graphics Forum, Pacific Graphics*

Tutor | *FEDEEH, Emmaüs Connect, GFN, HDO* 2017 - 2019

- Volunteered with various organizations to support children, teenagers, and the elderly with diverse learning needs, including cognitive disabilities, to enhance their professional and personal development

Math instructor | *Acadomia Paris* 2017 - 2019

- Private tutoring for middle and high school students in preparation of *brevet des collèges* and *baccalauréat*.

SKILLS

Programming: Advanced Python and C++, Intermediate OCaml, Java, Cuda

Libraries: Pytorch, OpenCV, Trimesh, Qt, OpenGL, Eigen, Libigl

Development: Git, CMake, Linux, Latex

Tools: Blender, Photoshop, InDesign, Premiere, Illustrator

Languages: French (Native), English (Fluent, TOEFL 111/120), Chinese (Intermediate, HSK2 196/200)

AWARDS

IC Distinguished Service Award - Honorable mention | *EPFL* 2023

In recognition of exceptional service benefiting the IC department and its students

EDIC fellowship | *EPFL* Sep 2022

First class honours | *National University of Singapore* Dec 2020

Seeds for the future | *Huawei* 2018

Selected as one of 10 students from France to participate in an international workshop at Huawei's headquarters in Shenzhen, focused on the future of telecommunications and IoT

Mention Très bien | *Baccalauréat Scientifique - Computer Science Specialization* Jul 2015

EXTRA-CURRICULAR ACTIVITIES

Vice-President | *EPFL PhDs of I&C (EPIC)*

- Planned and carried out recreational activities for Computer Science PhDs at EPFL (around 300 students)
- Hosted monthly tech-talks with research engineers (Meta, Google, Uber, Swisscom, ...)

Hobbies: Gaming (*Souls, indie games, RPGs, VR*), Chess, Writing, Reading (SF, Fantasy), Badminton, Biking, Hiking, Judo (brown belt), Watercolor