JÉROME EERTMANS

PhD student in Differentiable Ray Tracing for Telecommunications

jeertmans@icloud.com · Belgium · www.eertmans.com · jérome-eertmans · jeertmans
0000-0002-5579-5360

EXPERIENCE

Teaching Assistant

Université catholique de Louvain

Sep 2021 – Ongoing · Louvain-la-Neuve, Belgium

- Teaching duties (practical sessions, evaluation, ...): see list here;
- Research on my PhD subject, under the supervision of Profs. Claude Oestges and Laurent Jacques.

Visiting Researcher

University of Bologna

Sep 2024 – Dec 2024 · Bologna, Italy

Visiting Prof. Vittorio Degli-Esposti's lab. and pursuing research on Machine Learning applied to Ray Tracing for Radio Propagation.

Reviewer

Université catholique de Louvain

Sep 2023 – Nov 2024 · Louvain-la-Neuve, Belgium

I have performed reviews for the following journals / conferences:

- IEEE: Access, Transactions on Vehicular Technology, and Journal of the Communications Society;
- European Conference on Antennas and Propagation: EuCAP 2026.

The above only includes experiences directly related to my current role. You may find the exhaustive list on my LinkedIn profile.

PROJECTS

DiffeRT

Repository - Python package with backend written in Rust

Differentiable Ray Tracer developed for my research with the following highlights:

- Built on top JAX for high-perfomance and differentiable code;
- Thourougly tested and well documented;
- Fully open access, along with its 2D variant DiffeRT2D.

Manim Slides

Repository - Python package

Presentation tool I developed to produce higher-quality presentations at conferences. Most of my presentations are created using this tool and can be viewed on my personal website. Manim Slides has already been used by other researchers to disseminate their research, some examples are available in the documentation.

You may find an extended list of my projects and contributions on my GitHub profile or on the projects page of my website.

MOST PROUD OF

ADE Scheduler
An open source alternative to UCLouvain's scheduling tool, that became the official university tool in Sep. 2024.

Manim Slides
An open source presentation tool, used by many for teaching, conference presentations, or thesis defenses.

Scouts
6 years as a scout (Les Scouts) leader.

STRENGTHS

Keen to learn · Communication · Multi-tasks · Leadership

Python · Rust · Continuous Integration

LANGUAGES

French	Native
English	B2+/C1
Dutch	B1
Italian	A2

EDUCATION

Ph.D. in Electrical engineering

Université catholique de Louvain

Sep 2021 – End of 2025

Thesis title: Differentiable Ray Tracing for Telecommunications

M.Sc. in Electro-mechanical engineering

Université catholique de Louvain

Sep 2019 – Jun 2021

Majored in mechatronics. I undertook a variety of course topics: telecommunications, open source software, numerical simulations, digital design of ICs, machine learning, mining pattern in data, etc., for a total of 112% workload. *Graduated Magna Cum Laude.*

PUBLICATIONS

Preprints

- **J. Eertmans**, S. Lequeu, B. Legat, L. Jacques, and C. Oestges, "Fast, differentiable, gpu-accelerated ray tracing for multiple diffraction and reflection paths," 2025. arXiv: 2510.16172 [eess.SP]. [Online]. Available: https://arxiv.org/abs/2510.16172.

Conference Proceedings

- **J. Eertmans**, N. Di Cicco, C. Oestges, L. Jacques, E. M. Vitucci, and V. Degli-Esposti, "Towards generative ray path sampling for faster point-to-point ray tracing," in *2025 IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN)*, 2025, pp. 1–6. DOI: 10.1109/ICMLCN64995.2025.11140249.
- **J. Eertmans**, E. M. Vittuci, V. Degli-Esposti, L. Jacques, and C. Oestges, "Comparing differentiable and dynamic ray tracing: Introducing the multipath lifetime map," in *2025 19th European Conference on Antennas and Propagation (EuCAP)*, 2025, pp. 01–05. DOI: 10.23919/EuCAP63536.2025.10999736.
- **J. Eertmans**, L. Jacques, and C. Oestges, "Fully Differentiable Ray Tracing via Discontinuity Smoothing for Radio Network Optimization," in *2024 18th European Conference on Antennas and Propagation (EuCAP)*, 2024, pp. 1–5. DOI: 10.23919/EuCAP60739.2024.10501570.
- **J. Eertmans**, C. Oestges, and L. Jacques, "Min-Path-Tracing: A Diffraction Aware Alternative to Image Method in Ray Tracing," in *2023 17th European Conference on Antennas and Propagation (EuCAP)*, 2023, pp. 1–5. DOI: 10.23919/EuCAP57121.2023.10132934.

Journal Articles

- **J. Eertmans**, C. Oestges, and L. Jacques, "DiffeRT2d: A Differentiable Ray Tracing Python Framework for Radio Propagation," *Journal of Open Source Software*, vol. 9, no. 98, p. 6915, 2024. DOI: 10.21105/joss.06915.
- **J. Eertmans**, "Manim Slides: A Python package for presenting Manim content anywhere," *Journal of Open Source Education*, vol. 6, no. 66, p. 206, 2023. DOI: 10.21105/jose.00206.

REFEREES

Prof. Claude Oestges
@ Université catholique de Louvain
claude.oestges@uclouvain.be

Prof. Laurent Jacques
@ Université catholique de Louvain
laurent.jacques@uclouvain.be

Prof. Vittorio Degli-Esposti
@ University of Bologna
v.degliesposti@unibo.it