



# Remco Royen

COMPUTER VISION ENGINEER - 3D POINT CLOUD PROCESSING - MACHINE LEARNING

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*"Towards seamless interactions between the digital and physical world through 3D processing"*

## Education

### Vrije Universiteit Brussel

Brussels, Belgium

PHD IN ENGINEERING SCIENCES

Nov. 2019 - Jun. 2024

- Awarded with a PhD fellowship strategic basic research at Research Foundation Flanders (FWO).
- Research interests are in computer vision and deep learning with focus on scalability, scene understanding and point cloud processing.
- Publications in reputable journals and conferences.
- Research collaborations with companies such as Xenomatix, Sabca and VoxelSensors, leading to a patent.
- Thesis title: "Adressing labelling, complexity, latency, and scalability in deep learning-based processing of point clouds".

### Vrije Universiteit Brussel & Université Libre de Bruxelles

Brussels, Belgium

M.SC IN ELECTRICAL ENGINEERING (SUMMA CUM LAUDE (88%))

Sep. 2017 - Jun. 2019

- Thesis title: "Scalable autoencoders for structured and unstructured data".

### Sapienza Università di Roma

Rome, Italy

M.SC IN ARTIFICIAL INTELLIGENCE AND ROBOTICS

Sep. 2018 - Jan. 2019

- Erasmus+ exchange program. Specialization in Artificial Intelligence and Machine Learning.

### Vrije Universiteit Brussel

Brussels, Belgium

B.SC. IN ENGINEERING

Sep. 2014 - Jun. 2017

## Skills

**Programming** Python, PyTorch, TensorFlow, Matlab, Java, Assembly

**Machine Learning** 3D Computer Vision, Deep Learning, Point Cloud Segmentation, Domain Adaptation, 6D Pose Estimation

**Soft Skills** Team player, Hard-working, Curious, Creative, Problem-solver, Communicator

**Languages** Dutch (C2), English (C1), French (C1), German (A1 - learning), Italian (A1)

## Experience

### Macq SA/NV

Brussels, Belgium

NEURAL NETWORKS INTERNSHIP

Jul. 2018 - Sep. 2018

- Synthetic data creation for data augmentation and its usage in the training of a YOLO network for license plate detection and OCR for smart traffic cameras.

### Aisin Europe

Braine-l'Alleud, Belgium

PROGRAMMING STUDENT JOB

Jul. 2017 - Sep. 2017

- Optimization of the automatic tests used for the validation of the software of gear boxes.

## Teaching experience

### Machine Learning and Big Data Processing

Vrije Universiteit Brussel

TEACHING ASSISTANT

2021-2024

- Responsible for lab sessions and exercises about neural networks. Guidance of student projects and grading.

### Master Theses

Vrije Universiteit Brussel

MASTER THESIS SUPERVISION

2020-2024

- Guidance of master theses in the domains of view synthesis, gaussian splatting and deep learning for meteorology

### Sensors and microsystem electronics

Vrije Universiteit Brussel

TEACHING ASSISTANT

2019

- Guidance lab sessions of programming a microcontroller in assembly language. Guidance of student projects and grading.

## Patents

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### Patent

R. Royen, A. Munteanu, and W. van der Tempel

## Journal articles

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### Joint prototype and coefficient prediction for 3d instance segmentation (in press)

R. Royen, L. Denis, and A. Munteanu

2024 IET Electronics Letters

### W6dnet: Weakly-supervised domain adaptation for monocular vehicle 6d pose estimation with 3d priors and synthetic data (in press)

Y. Lyu, R. Royen, and A. Munteanu

2024 IEEE Transactions on Instrumentation and Measurement

### Pcgen: a fully parallelizable point cloud generative model (in press)

N. Vercheval, R. Royen, A. Munteanu, and A. Pižurica

2024 MDPI Sensors

### Gpu rasterization-based 3d lidar simulation for deep learning

L. Denis, R. Royen, Q. Bolsee, N. Vercheval, A. Pižurica, and A. Munteanu

2023 MDPI Sensors

### Masklayer: Enabling scalable deep learning solutions by training embedded feature sets

R. Royen, L. Denis, Q. Bolsee, P. Hu, and A. Munteanu

2021 Neural Networks

## Conference proceedings

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### RESSCAL3D++: Joint acquisition and semantic segmentation of 3D point clouds (under review)

R. Royen, K. Pataridis, W. van der Tempel, and A. Munteanu

2024 IEEE International Conference on Image Processing (ICIP)

### Resscal3d: Resolution scalable 3d semantic segmentation of point clouds

R. Royen and A. Munteanu

2023 IEEE International Conference on Image Processing (ICIP)

### Mono6d++: Learning point cloud visibility for 3d prior-based vehicle 6d pose estimation

Y. Lyu, O. Ducastel, R. Royen, and A. Munteanu

2023 11th European Workshop on Visual Information Processing (EUVIP)

### Improved block merging for 3d point cloud instance segmentation

L. Denis, R. Royen, and A. Munteanu

2023 24th International Conference on Digital Signal Processing (DSP)

### A deep-learning-based approach to automatically measuring foots from a 3d scan

N. N. Kaashki, R. Royen, X. Dai, P. Hu, and A. Munteanu

2022 IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE)

### Mono6d: Monocular vehicle 6d pose estimation with 3d priors

Y. Lyu, R. Royen, and A. Munteanu

2022 IEEE International Conference on Image Processing (ICIP)

## References

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### Prof. Dr. ir. Adrian Munteanu

Professor at Vrije Universiteit Brussel

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## Extra

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**Hobbies** Theater, hiking, running, traveling and exploring

**Peer-reviewer** CVPR, TIP, ICIP, ACIVS, BMVC, DSP, Neural Networks