

Colin Decourt

COMPUTER VISION ENGINEER - PHD STUDENT · ARTIFICIAL NATURAL INTELLIGENCE TOULOUSE INSTITUTE (ANITI)

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Experience

ANITI - NXP Semiconductors

Toulouse, France

PHD STUDENT IN DEEP LEARNING

Oct 2020 - Present

- Creation of a deep neural network architecture for object classification using radar data.
- Development of a lightweight Faster R-CNN based architecture for range-doppler spectrum features extraction and object detection.
- Creation of a memory-efficient architecture based on convolutions and convolutional recurrent neural networks for single-view (range-doppler, range-angle) or multi-view (range-azimuth-doppler tensors) object detection and segmentation.
- Preliminary work on self-supervised learning and domain adaptation for radar object detection.
- Accepted article at IEEE IV 2022 conference, another in review. See publications for further details.
- Assistant professor in computer vision (classification, detection, segmentation) and computer science (C and Python programming, algorithmic). Details are available here.
- Co-supervision of internships: Domain adaptation for automotive radar object detection (NXP Semiconductors, 2022); Development of a multi-sensor platform for automotive application (NXP Semiconductors, 2021).

NXP Semiconductors

Toulouse, France

RESEARCH ENGINEER

Feb 2020-Aug 2020

- Creation of simple algorithms for target detection and classification using FMCW radar data.
- Introduction to radar signal processing.
- Bibliography on AI for automotive radar.

Ecole de Technologie Supérieure

Montréal, Quebec, Canada

COMPUTER VISION RESEARCHER

Jun 2019-Sep 2019

- Research project about left ventricle segmentation in pediatric MRI for inter-ventricular communication detections.
- Creation of a generative adversarial network for left ventricle segmentation in pediatric MRI.
- Creation of a semi-supervised framework to reduce the number of annotated data for training.
- Introduction of a new weighted cross-entropy loss function using distance transform to improve segmentation performance.
- Accepted article in Computers in Biology and Medicine journal. See publications for further details.

Sogetrel

Bordeaux, France

ACTIVITY MANAGEMENT OPERATOR

Jun 2018-Sep 2018

- Establishment and monitoring of technicians' reports following interventions on the Orange network.
- Links between customers, technicians and operators.

Publications

PUBLISHED

C. Decourt, R. VanRullen, D. Salle, T. Oberlin. **DAROD: A Deep Automotive Radar Object Detector on Range-Doppler maps**. IEEE Intelligent Vehicles Symposium (IV), Aachen, Germany, 2022

C. Decourt, L. Duong. **Semi-supervised generative adversarial networks for the segmentation of the left ventricle in pediatric MRI**, Computers in Biology and Medicine, Volume 123, 103884, ISSN 0010-4825, 2020

IN REVIEW

C. Decourt, R. VanRullen, D. Salle, T. Oberlin. **A recurrent CNN for online object detection on raw radar frames**. arXiv preprint arXiv:2212.11172., 2022

Education

University of Toulouse 3 - Paul Sabatier

Toulouse, France

PHD ARTIFICIAL INTELLIGENCE

2020 - present

- Research topic: Multiple target extraction, identification and tracking for radar using AI.
- PhD as part of the ANITI program, in collaboration with NXP Semiconductors.
- **Advisors:** Rufin VanRullen (CNRS), Thomas Oberlin (ISAE-SUPAERO), Didier Salle (NXP Semiconductors)

**Bordeaux Graduate Engineering School in Telecommunications
(ENSEIRB-MATEMCA)**

Bordeaux, France

MSC IN TELECOMMUNICATIONS, MAJOR ARTIFICIAL INTELLIGENCE

2017 - 2020

- Artificial intelligence (machine learning, computer vision, natural language processing, reinforcement learning)
- Signal and image processing
- Digital communications and networks
- Software engineering

Lycée Alphonse Daudet

Nîmes, France

UNDERGRADUATE STUDIES TO PREPARE FOR COMPETITIVE ENTRANCE EXAMS TO ENGINEERING
SCHOOLS.

2015 - 2017

- Mathematics, Physics, French literature and English.

Skills

LANGUAGES: FRENCH (NATIVE), ENGLISH (FLUENT), GERMAN (BEGINNER)

PROGRAMMING LANGUAGES: PYTHON, C/C++, JAVA, SQL

DEEP LEARNING FRAMEWORKS: PYTORCH, PYTORCH LIGHTNING, TENSORFLOW, KERAS

SOFTWARE DEVELOPMENT FRAMEWORKS: LINUX, DOCKER, SINGULARITY, SLURM, BASH, GIT