

# Antonin VOBECKY

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## EDUCATION

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- 2019 – 2025 **Doctoral Degree (PhD)** in COMPUTER VISION  
*expected Faculty of Electrical Engineering, Czech Technical University*  
Advisor [Josef Šivic](#) (CTU), co-advisors: [Patrick Pérez](#) (Kyutai), [David Hurych](#) (valeo.ai)
- 2014 – 2019 Bachelor's (BSc) & **Master's Degree (MSc)** in ARTIFICIAL INTELLIGENCE AND COMPUTER VISION  
*Faculty of Electrical Engineering, Czech Technical University*  
Summa cum laude. Merit scholarships.

## SELECTED PUBLICATIONS & PROJECTS

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DRIVE&SEGMENT: **Unsupervised semantic segmentation** of urban scenes via cross-modal distillation.

- The first author, published at [ECCV'22](#) (CORE A\*, **oral** presentation) and to be published in IJCV (IF=14.5) in 2025
- Developed a multimodal unsupervised segmentation approach to train machine learning models.
- Trained a model using multiple modalities: RGB images and 3D points as priors during training.

POP-3D: **Open-vocabulary 3d occupancy prediction from images**

- Published at [NeurIPS'23](#) (CORE A\*), the first author.
- Trained a model using 3D points and images to perform open-vocabulary 3D occupancy prediction from images.
- The model allows for 3D segmentation based on natural language queries from provided RGB images.
- Multi-GPU training on HPC infrastructure (Karolina supercomputer).

**Dataset augmentation using generative models**

- paper *Artificial dummies for urban dataset augmentation* published at [AAAI'21](#) (CORE A\*), the first author
- pedestrian dataset augmentation using generative adversarial networks to improve the performance of pedestrian detectors

A study of **Test-time Contrastive Concepts for Open-World Semantic Segmentation**

- training-free approaches to single-object segmentation using pre-trained vision-language models
- analysis of large-scale pre-training image-language data, working with LLMs (Mixtral)
- a conference submission, collaboration with [Monika Wyszczkańska](#) (Warsaw Uni.), [Oriane Siméoni](#) (Meta FAIR), and others

**Unsupervised object localization**: Observing the background to discover objects

- Published at [CVPR'23](#) (CORE A\*), collaboration with [Oriane Siméoni](#) (Meta FAIR), Gilles Puy (valeo.ai) and others
- A lightweight approach to unsupervised object localization by looking for the background in the feature space

MOCA: **Self-supervised representation learning** by predicting masked online codebook assignments

- published in [TMLR](#), to be presented as a poster at ICLR'25
- collaboration with [Spyros Gidaris](#), [Andrei Bursuc](#) (both valeo.ai) and others
- single-stage and standalone method with good contextual reasoning properties and invariance to image perturbations

**Detecting decision ambiguity from facial images**

- published at a conference on Automatic Face & Gesture Recognition ([FG 2018](#))
- collected a large-scale dataset from “Who Wants to Be a Millionaire?” TV show, automatic annotation of the dataset
- prepared during an internship with [Jiri Matas](#) (CTU VRG)

**Unpublished projects**: large vision-language model fine-tuning for autonomous driving; LLM fine-tuning on domain-specific data

## SELECTED WORK EXPERIENCE

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**Machine Learning Researcher** at EXA4MIND

2023 – now

- Researcher in the [EXA4MIND](#) EU project targeted at working with extreme-scale data
- developed and helped to deploy computer vision software to run on hundreds of terabytes of industry videos on HPC

**Visiting Researcher** at VALEO.AI, Paris

'22,'23,'24

- Worked with [Patrick Pérez](#) (now Kyutai), [Andrei Bursuc](#), and [Oriane Siméoni](#) (now FAIR) on research in ML for autonomous driving, collaboration resulted in several first-author publications, e.g., [ECCV'22](#) or [NeurIPS'23](#), and more

**Student Researcher** at VALEO

2017 – now

- Research in computer vision in perception systems and data generation for autonomous driving
- Selected publications: generative model at [WACV'21](#), dataset at [ICCVw'19](#)

## SKILLS AND OTHER EXPERIENCE

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Extensive **experience** with Python, PyTorch, SciPy, Bash, HPC, and more.

**Reviewer** for CVPR, ECCV, NeurIPS, IJCV, and others.

**Voluntary work** in the Czech borderlands; running and co-organizing **youth camps** and formative **courses**

Proficient in **English**, playing **guitar**, local **football** team founder/manager/player