Antonin Vobecky

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https://vobecant.github.io

Research interests

Computer vision, machine learning, language-image alignment, multi-modal models (image, language, 3D and more)

Education

2019–today **Ph.D. student**, *CTU in Prague*, Prague, Czech Republic
Supervisors: Josef Sivic and Patrick Peréz
ELLIS Ph.D. student
Thesis: Weakly supervised learning for visual recognition
Publications: [1, 2, 3] *Collaborations:* [4, 5, 6, 7]
Visits: valeo.ai ('21,'22,'23,'24), working w/ Andrei Bursuc, Oriane Siméoni and Spyros Gidaris

Selected projects

Open-Vocabulary 3D Occupancy [1]

Open-vocabulary 3D semantic voxel occupancy map from input 2D images with the objective of enabling 3D grounding, segmentation and retrieval of free-form language queries

Unsupervised semantic segmentation [2]

Pixel-wise semantic image segmentation without any manual annotation, using only raw non-curated images and 3D LiDAR scans. We used multiple training (Waymo Open, nuScenes) and evaluation datasets.

2015–2016 **Master degree in Computer Vision and Image Processing**, *Czech Technical University in Prague*, Prague, Czech Republic
graduated with distinctions
Internship at Valeo Prague
Publications: [8], *Collaborations:* [9]

2012–2015 **Bachelor degree in Robotics**, *Czech Technical University in Prague*, Prague, Czech Republic
graduated with distinctions distinctions, dean's award for the thesis
Publications: [10]

Research collaborators

CTU Prague Josef Sivic, Jiri Matas
Kyutai Patrick Pérez
valeo.ai Andrei Bursuc, Oriane Siméoni, Spyros Gidaris, Gilles Puy, David Hurych

Activities

2020-today **Journal reviewing**, IJCV
2020-today **Conference reviewing**, CVPR, ECCV, NeurIPS, RA-L

Awards

2023 ICVSS 2023 essay competition winner
2017 Valeo scholarship for talented students.

Computer skills

Programming Python, Matlab, Linux shell
Other PyTorch, Tensorflow, scikit-learn, LaTeX

Talks and presentations

2023 **NeurIPS'23**, *poster presentation of [1]*
2022 **ECCV'22**, *oral presentation of [2]*
2022 **Willow, INRIA**, *Ph.D. works presentation*
2022 **IMAGINE, ENPC**, *Ph.D. works presentation*

Work in European research projects

2023–today **CTU Prague**, *EXA4MIND – Extreme Analytics for Mining Data spaces*

Summer schools

ICVSS 2023 International Computer Vision Summer School 2023. Sicily, Italy

Languages

English Fluent
French Beginner
Czech Native

Full list of publications

[1] Antonin Vobecky, Oriane Siméoni, David Hurych, Spyridon Gidaris, Andrei Bursuc, Patrick Pérez, and Josef Sivic. Pop-3d: Open-vocabulary 3d occupancy prediction from images. In *NeurIPS*, 2023.

[2] Antonin Vobecky, David Hurych, Oriane Siméoni, Spyros Gidaris, Andrei Bursuc, Patrick Pérez, and Josef Sivic. Drive&segment: Unsupervised semantic segmentation of urban scenes via cross-modal distillation. In *Proceedings of the European Conference on Computer Vision (ECCV)*, October 2022.

[3] Antonin Vobecky, David Hurych, Michal Uřičář, Patrick Pérez, and Josef Sivic. Artificial dummies for urban dataset augmentation. In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 35, 2021.

[4] Oriane Siméoni, Chloé Sekkat, Gilles Puy, Antonin Vobecky, Éloi Zablocki, and Patrick Pérez. Unsupervised object localization: Observing the background to discover objects. In *CVPR*, 2023.

[5] Sophia Sirko-Galouchenko, Alexandre Boulch, Spyros Gidaris, Andrei Bursuc, Antonin Vobecky, Patrick Pérez, and Renaud Marlet. Occfeat: Self-supervised occupancy feature prediction for pretraining bev segmentation networks. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2024.

[6] Spyros Gidaris, Andrei Bursuc, Oriane Siméoni, Antonin Vobecky, Nikos Komodakis, Matthieu Cord, and Patrick Perez. MOCA: Self-supervised representation learning by predicting masked online codebook assignments. *Transactions on Machine Learning Research*, 2024.

[7] Michal Uricar, Ganesh Sistu, Hazem Rashed, Antonin Vobecky, Varun Ravi Kumar, Pavel Krizek, Fabian Burger, and Senthil Yogamani. Let's get dirty: Gan based data augmentation for camera lens soiling detection in autonomous driving. In *WACV*, 2021.

[8] Antonin Vobecky, Michal Uricar, David Hurych, and Radoslav Skoviera. Advanced pedestrian dataset augmentation for autonomous driving. In *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*, Oct 2019.

[9] Michal Uricár, Jan Ulicny, Ganesh Sistu, Hazem Rashed, Pavel Krizek, David Hurych, Antonin Vobecky, and Senthil Yogamani. Desoiling dataset: Restoring soiled areas on automotive fisheye cameras. In *Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops*, 2019.

[10] Pavel Jahoda, Antonin Vobecky, Jan Cech, and Jiri Matas. Detecting decision ambiguity from facial images. In *IEEE International Conference on Automatic Face & Gesture Recognition (FG 2018)*, 2018.