# MIROSLAV PURKRABEK


**Computer Vision & Machine Learning Researcher**

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## SELECTED PUBLICATIONS

For the full list (9 publications), see my website – MiraPurkrabek.github.io

**BBoxMaskPose v2: Expanding Mutual Conditioning into 3D**
Purkrabek, Kolomiiets, Matas; GitHub ★ 150+ **in review**
Better 2D predictions act as reliable prompts for 3D reconstruction, demonstrating that accurate 2D conditioning is a prerequisite for multi-person 3D pose. BMPv2 sets new state of the art in both standard and crowded 2D benchmarks, becoming the first method to surpass 50 AP on OCHuman. As a result, 3D pose estimation in crowds approaches the reliability of the 2D pose predictions.

**Detection, Pose Estimation and Segmentation for Multiple Bodies: Closing the Virtuous Circle**
Purkrabek, Matas; GitHub ★ 150+, online demo **ICCV 2025**
Three small specialized models, each conditioned by the others, form a self-improving loop. It beats human-centric foundation models (AP 41.3 → 49.2) and sets a new SOTA on OCHuman in instance segmentation and pose estimation.

**ProbPose: A Probabilistic Approach to 2D Human Pose Estimation**
Purkrabek, Matas; GitHub ★ 45+, Pip package ↓ 350+, iPad demo **CVPR 2025**
Introduces a probabilistic modeling approach that handles partially visible individuals better and reduces false positive predictions. Using out-of-image keypoints is necessary for more reliable modeling of the underlying distribution and robust evaluation.

**BLANKET: Anonymizing Faces in Infant Video Recordings**
Hadera, Cech, Purkrabek, Hoffmann; **ICDL 2025 oral**

**Improving 2D Human Pose Estimation in Rare Camera Views with Synthetic Data**
Purkrabek, Matas; GitHub ★ 50+, Best Poster 🏆 **Face and Gestures 2024**

## RESEARCH EXPERIENCE

### Research Visit
**Real Virtual Humans, University of Tübingen**
December 2025 – March 2026 | Tübingen, DEU
- Visiting prof. Pons-Moll to deepen my knowledge about 3D avatars

### Researcher
**Visual Recognition Group, Czech Technical University in Prague**
February 2019 – Ongoing | Prague, CZE
- Specialized in analyzing the human body, including Pose Estimation, 3D Shape, and UV Map estimation, along with detection and segmentation
- Co-supervising more junior colleagues in writing their first papers
- Managing the annotation process for our team of annotators
- Supervised by prof. Jiri Matas

### Research Intern
**Visual Cognitive Systems lab, University of Ljubljana**
October 2018 – March 2019 | Ljubljana, SVN
- Initial experience in computer vision research during my Erasmus stay
- Supervised by prof. Matej Kristan

## INDUSTRY EXPERIENCE

### Software Developer
**Porsche Engineering Services**
March 2020 – July 2022 | Prague, CZE
- Production code for Porsche's supercharger, 1 000+ units worldwide
- Production code for Porsche Macan's control unit, 100 000+ cars worldwide

## IN ONE SENTENCE

*I enjoy connecting basic research with real-world applications.*

## RESEARCH FOCUS

Human 2D & 3D Pose | Robustness | UV Map | 3D Scene Understanding | Person Detection and Segmentation

## TECHNICAL SKILLS

**Python**
- Deep learning papers
- Training models (eg. PMPose-h) for 10+ days on 8 GPUs using SLURM
- Porsche automated testing (daily runs)

**C / C++**
- Production code for Porche Macan
- Plug-n-charge feature for Porsche charger
- University course autonomous robot

## FRAMEWORKS

PyTorch | OpenCV | SLURM | Git | SMPL | CUDA | Blender | MMCV

## AWARDS

### Outstanding Reviewer
**CVPR 2025**

### Best Poster Award
**FG 2024**

### Award for Excellent Results
**Czech Ministry of Interior**

## EDUCATION

**Ph.D. in Computer Science**
Computer Vision, AI
**Czech Technical University in Prague**
topic: Robust Human Pose Estimation
supervisor: prof. Jiri Matas
Feb 2023 – Ongoing (exp. 2026/27)

**M.S. in Computer Science**
AI, Computer Vision, Cyber Security
**Czech Technical University in Prague**
topic: Multi-object Multi-view Tracking
supervisor: prof. Jiri Matas
Oct 2020 – June 2022

**Erasmus** – University of Ljubljana, SVN