

MIROSLAV PURKRABEK

Computer Vision Researcher

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SELECTED PUBLICATIONS

For the full list, see my website – [MiraPurkrabek.github.io](#)

Detection, Pose Estimation and Segmentation for Multiple Bodies: Closing the Virtuous Circle

[Purkrabek](#), Matas; [ICCV 2025](#)

Three small specialized models, each conditioned by the others, form a self-improving loop: *BBox-Mask-Pose*. The loop improves consistency of different representations, beats large foundation models (AP 41.3 → 49.2) and sets a new SOTA on OCHuman in instance segmentation and pose estimation. [GitHub](#) ★ 47


ProbPose: A Probabilistic Approach to 2D Human Pose Estimation

[Purkrabek](#), Matas; [CVPR 2025](#)

ProbPose introduces a probabilistic modeling with calibrated probability maps and a presence probability, which handle partially visible individuals better and reduce false positive predictions. Using out-of-image keypoints is necessary for more reliable modeling of the underlying distribution and robust evaluation. [GitHub](#) ★ 30

Improving 2D Human Pose Estimation in Rare Camera Views with Synthetic Data

[Purkrabek](#), Matas; [Face and Gestures 2024](#)

 Best Poster Award
RePoGen, a novel method for the generation of synthetic humans in unusual poses, is not focused on realism but the diversity of generated poses. Training on RePoGen data significantly improves accuracy for rare viewpoints (AP 69.2 → 81.1) without compromising performance on common views. [GitHub](#) ★ 48

BLANKET: Anonymizing Faces in Infant Video Recordings

Hadera, Cech, [Purkrabek](#), Hoffmann; [ICDL 2025](#)

EXPERIENCE

Researcher

[Visual Recognition Group, Czech Technical University in Prague](#)

 February 2019 – Ongoing

 Prague, CZ

- Specialized in analyzing the human body, including Pose Estimation, 3D Shape, and UV Map estimation, along with detection and segmentation
- Co-supervised more junior colleagues in writing their first papers
- Managing the annotation process for our team of annotators
- Supervised by prof. Jiri Matas

Research Assistant

[Visual Cognitive Systems lab, University of Ljubljana](#)

 October 2018 – March 2019

 Ljubljana, SLO

- Initial experience in computer vision research during my Erasmus stay
- Supervised by prof. Matej Kristan

Software Developer

[Porsche Engineering Services](#)

 March 2020 – July 2022

 Prague, CZ

- Wrote production code for Porsche's (then) most powerful supercharger
- Collaborated in a start-up-like team at CARIAD on out-of-distribution detection for autonomous driving

Head Coach + Assistant Coach

[TJ Sokol Kralovske Vinohrady \(SKV\)](#)

 August 2017 – August 2025

 Prague, CZ

- Led a floorball team to the quarterfinals of the highest Czech league

IN ONE SENTENCE

I enjoy connecting basic research with real-world applications.

RESEARCH FOCUS

Human 2D Pose, 3D Pose and Shape

Human Body

UV Map Estimation

Person Detection and Segmentation

LANGUAGES

English

French, DELF B1



Python

- All the research papers and theses
- Training new models (eg. ProbPose-h) for 10+ days on 4 GPUs using SLURM
- Porsche automated testing (daily runs)

C / embedded

- Led 3-person team
- Build and programmed autonomous robot
- Won course challenge

C++

- Plug-n-charge feature for Porsche charger
- Requirements → design → code

ACTIVITIES

Invited Talks

[CVWWs 24 and 25, SCCH Research Day](#)

Co-organized and Talked at

[AI4Sports 2024](#)

Outstanding Reviewer

[CVPR 2025](#)

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)


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, SI

PROJECTS

For more details and latest information, see my website – MiraPurkrabek.github.io

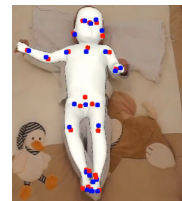
Set of Forensic Analytical Tools for Image and Video Processing for Criminal Police Service

The project, a collaborative effort with VUT (Brno University of Technology), involves creating a suite of advanced forensic tools for the Czech Republic Police, funded by the Ministry of Interior. These tools focus on the automatic processing of images and videos, specifically using human poses to enhance the efficiency and accuracy of criminal investigations.



Modeling Infant Sensorimotor Development

The project led by Matej Hoffman focuses on the behavior of infants to gain a deeper understanding of human development. My contribution to this project involves the precise estimation of 2D poses of babies in videos, a crucial aspect that helps in analyzing and interpreting infant movements and interactions. This work is part of a larger effort to model human behavior, particularly in the early stages of life, providing valuable insights for various applications.



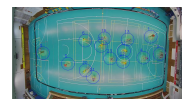
Detection, Identification and Monitoring of Animals by Advanced Computer Vision Methods

The project led by Lukas Pícek from University of West Bohemia focuses on the identification of wild animals (especially lynxes) in camera trap images. My contribution to this project involves the estimation of 2D poses of animals, which improves identification accuracy as each animal has a different texture on each side. The project is part of a larger effort to protect the environment using computer vision and AI.



Advanced Video Analysis for Floorball Player Tracking

This project extends my long-standing interest in sports analysis, a journey that began with my bachelor thesis and evolved through my master's work. The aim is to harness video analysis to gain insight into player movements and team dynamics, enhancing coaching strategies and game understanding.



PoseAnnotator

A lightweight, local alternative to CVAT and LabelStudio. Originally developed to create the RePoGen dataset, we have since used it for multiple datasets. This easy-to-use Python tool features a simple GUI for annotating 2D human poses in images. Ideal for researchers and developers, PoseAnnotator simplifies the data labeling process for human pose estimation projects. Our research group already used it not only for annotating pose but also for other structured keypoints like facial landmarks.

