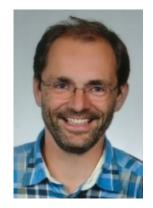# Keynote

Visual Tracking in the 21st Century

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Visual tracking is an old area that has recently seen a surge in activity. The interest has been fueled by progress in related fields like detection, segmentation and optic flow as well as by application-driven demand and the increase in the available computing power.

The published tracking methods differ in many aspects such as the speed, the complexity of the model of the tracked entity, the (geometric) transformations assumed, the mode of operation (casual and non-causal), the ability to adapt and learn, the robustness to occlusion and assumptions about the observer. I will review the dataset used in recent publications and show that the "tracker space" is still wide open with large areas to be explored.

I will then present three trackers developed by me and my collaborators that operate at very different points in the speed-robustness-flexibility space that are close to the "convex hull" of published methods: the TLD tracker, the Flock-of-Trackers and the Zero-Shift-Point tracker. I will focus on a common aspect shared by the trackers: mechanisms for prediction and handling of tracking errors. Such mechanisms contribute to tracker robustness, which will be demonstrated live.

Jiří Matas received his MSc degree in cybernetics (with honours) from the Czech Technical University, Prague, Czech Republic, in 1987 and his PhD from the University of Surrey, UK, in 1995. From 1991 to 1997, he was a research fellow at the Centre for Vision, Speech and Signal Processing at the University of Surrey. In 1997, he joined the Center for Machine Perception at the Czech Technical University in Prague. Since 1997, he has held various positions at these two institutions.

He has published more than a hundred papers in refereed journals and conferences. His publications have more than 1100 citations in the Science Citation Index. He received the best paper prize at the British Machine Vision Conferences in 2002 and 2005 and at the Asian Conference on Computer Vision in 2007. Jiří Matas has served in various roles at major international conferences (e.g. ICCV, CVPR, ICPR, NIPS), co-chairing ECCV 2004 and CVPR 2007 and is on the editorial board of IEEE Transactions on Pattern Analysis and Machine Intelligence and the International Journal of Computer Vision.

His research interests include object recognition, sequential pattern recognition, ensemble methods, invariant feature detection, and Hough Transform and RANSAC-type optimization.