Název práce	1. česky: Vizuální lokalizace pro HoloLens 2. anglicky: Visual Localization with HoloLens
Studijní program (název)	Otevřená informatika
Studijní program (typ)	magisterský
Obor:	Umělá inteligence
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literatura	[1] Arandjelović, R.; Gronat, P.; et al. NetVLAD: CNN architecture for weakly supervised place recognition. In IEEE Conference on Computer Vision and Pattern Recognition, 2016. [2] Taira, H.; Okutomi, M.; et al. InLoc: Indoor Visual Localization with Dense Matching and View Synthesis. In 2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition, June 2018, ISSN 1063-6919, pp. 7199–7209, doi:10.1109/CVPR.2018.00752. [3] Garg, R.; Kumar, B. V.; et al. Unsupervised CNN for single view depth estimation: Geometry to the rescue. In European Conference on Computer Vision, Springer, 2016, pp. 740–756. [4] Zhang, Y.; Funkhouser, T. Deep Depth Completion of a Single RGB-D Image. The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018. [5] Van Gansbeke, W.; Neven, D.; et al. Sparse and Noisy LiDAR Completion with RGB Guidance and Uncertainty. In 2019 16th International Conference on Machine Vision Applications (MVA), IEEE, 2019, pp. 1–6.
pokyny	1) Review the state of the art in indoor visual localization, see [1,2] and references therein. 2) Adjust method [2] to local environment and image acquisition using Hololens. Create new 3D data set for the local environment and evaluate the accuracy of the localization w.r.t. a ground truth in that environment. 3) Analyze sources of errors and inaccuracies, in particular the influence of incorrectly constructed 3D data set and its maintenance in time on the localization accuracy and propose an improvement of [2] for the local environment. Investigate, e.g., single view depth construction, depth completion methods [3,4]. 4) Demonstrate and evaluate the improved method for Hololens localization.
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