

Object Recognition by Deep Neural Network Applied for the NAO Robot

Martin Kostelanský

Department of Theoretical Computer Science, Faculty of Information Technology, CTU in Prague
Thákurova 9, 160 00 Prague 6, Czech Republic

`kostema3@fit.cvut.cz`

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Abstract

In my work, I researched machine vision and object recognition capabilities. I used the newest deep convolutional neural networks in framework Keras. I examined their architecture and possibilities of their fine-tuning. Especially correlation between the depth of fine-tuning and classification accuracy. In my experiments, I created new network combining two types of networks. Results showed that this network is more successful in classification than the original ones. Then I created dataset containing almost three thousands photos of Faculty of information technology, CTU in Prague. Photos were sorted by place (class, elevator, hall, stairs) or by building (TH:A, T9). I trained selected networks on this dataset, and the best ones were implemented in application for robot NAO, by which it can determine with 93.48% accuracy where at the faculty is he located and with 76.09% accuracy in which of the buildings is he standing.

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