

06 January 2017

To whom it may concern,

This letter is to certify that Mr. JeanPiere Demir has worked as an intern under my supervision at the German-Turkish Advanced Research Centre for ICT (GT-ARC) from 20<sup>th</sup> June to 2<sup>nd</sup> September, 2016. GT-ARC is a non-profit research organization in Berlin, established as an affiliated institute of Technische Universität Berlin. GT-ARC is co-located with the Distributed Artificial Intelligence Laboratory (DAI-Labor) of TU Berlin, with which it works very closely in research and development projects.

During his internship, Mr. Demir has worked on a cognitive robotics project with the aim of developing a machine learning algorithm for recognizing basic human actions through 3D video frames. First, he developed a feature extraction algorithm which tracks human body and extracts body joint coordinates and their movement speeds in consecutive video frames. Then, these extracted features were quantized using K-means clustering. Finally, he successfully trained a simple discrete Hidden Markov Model using video frames from people realizing basic actions to be recognized, such as walking, sitting, standing and reaching to an object. By the end of the internship, he has delivered a real-time functioning human action recognizer algorithm ready to be used on real-time video inputs. As part of a 2-person project team, JeanPiere significantly contributed at his part to the developed solution that showcased the basic skills of recognizing basic human actions for social robots, later to be used in understanding human intentions.

With his high-level of enthusiasm for robotics and machine learning algorithms, strong desire to learn, and already established skills in programming, Mr. Demir has well met our expectations from the internship. He also demonstrated an always-positive attitude and excellent communication skills during his stay in Berlin. We were very pleased to get to know him and host him for an internship at GT-ARC.

For further inquiries about this letter, please do not hesitate to contact me via email (fikret.sivrikaya@gt-arc.com) or by phone (+49 30 31474010).

Sincerely,



Dr. Fikret Sivrikaya

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