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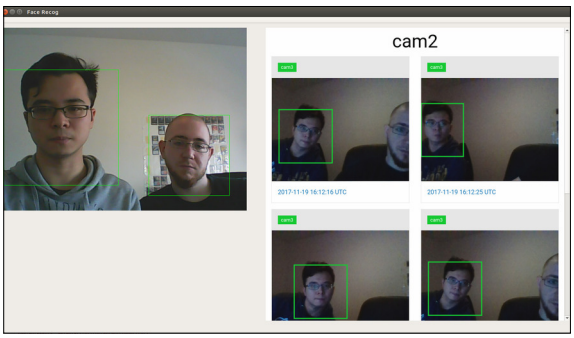
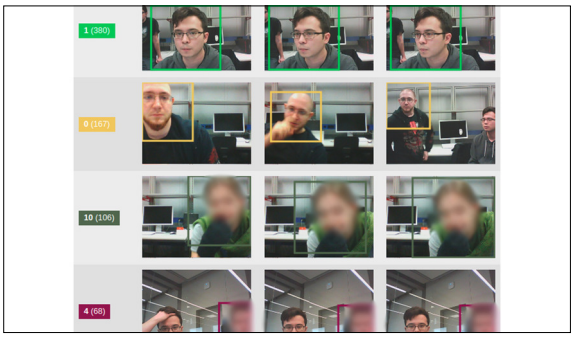
Subject Area	Software

Study on interactive face recognition



Snapshot from the FaceRecogClient



Top 4 clusters in our application

Introduction: Recognizing faces is a complex problem that humans are able to solve rather well. Describing the human face in form of a computer problem has always been a difficult task. Most traditional algorithms for recognizing faces are limited. For example, face recognition systems used for recognition in biometric passports have many constraints in face positioning, expression and lighting conditions.
The Information Age has brought exponential growth in generated data and computing power. This development opens the door for approaches that were not feasible in the past. One area of research that has seen great achievements over the last few years is the field of deep learning, which is inspired by the way neurons work and learn.
Our goal was to explore the capabilities of already existing face recognition services and technologies, and document its possibilities and limitations. As a result of these newly gained insights, we developed a prototype as a possible showcase for the exhibition “Informatik zum Anfassen”.

Procedure / Result: We decided to compare two different cutting-edge deep learning technologies: Face API, a closed source cloud service from Microsoft Azure’s Cognitive Services, and Facenet, an open source project based on Google’s deep learning Framework TensorFlow. We performed various evaluations with a large set of publicly available celebrity face photographs and a small set of photographs taken by ourselves.

Solution: The result of this thesis is a working prototype of a distributed system capable of recording and differentiating people in real time without requiring any user interaction. It can support many camera clients at once and comes with an administration web-interface to explore the data.