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Novel technique to determine age and gender from digital photograph

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Novel technique for Age and Gender estimation from a digital photograph of human being is presented. The technique uses supervised machine learning algorithms primarily taking advantage of high-performance of non-linear kernels while maintaining real-time operation. It consists of a pipeline of algorithms. The process is divided in two phases: calibration and execution. In the calibration phases, a database of labeled images is used as input. Each image is passed through the pipeline and various mathematical features are extracted. All these features are collectively fed to the machine-learning algorithm (e.g.: SVM or random-forest), which analyses all the samples at once and generates model file based on various parameters, which are fine-tuned based on the specific application. Once model files have been generated, the system can be run in execution mode. In this mode, an image is fed into the system, either through the camera, or from computer disk. This image goes through same pipeline; similar mathematical features are extracted from the image and are fed to the machine-learning algorithm. The machine-learning algorithm then uses the model files created in previous step to mathematically estimate which category the current input data belongs to. In case of gender machine learning algorithms are run in classification mode, which classify the data in two categories: male (0) and female (1). For the age estimation, we run the machine learning algorithms in regression mode, which attempts to predict the exact age. The pipeline consists of steps like image registration, face detection, image filters, feature extraction, dimensionality reduction, machine-learning algorithm and result aggregator.

Biography

Pooja Jain is a student at University of Windsor, Canada. She has over 5 years of industry experience in software and algorithms development. Her area of interests includes machine learning, artificial intelligence, algorithm design and software development.

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