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King Fahd University of Petroleum and Minerals

College of Computer Sciences and Engineering

Information and Computer Science Department

ICS 411: Senior Project (Term 172)

AGE AND GENDER RECOGNITION USING

DEEP LEARNING

Project Proposal

Feb 11, 2018

Mustafa Al-Turki

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DEEP LEARNING

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# Introduction

## Purpose of This Document

This document first introduces the need of age and gender recognition system that automates the process of detecting the age and gender of a person using an image of their face. In addition, it provides the objectives and an initial tentative plan for the project in the entire 15-week period including deliverables expected after every week.

# Scope of the Project

## Project Overview

This project aims to produce a model capable of classifying age and gender using deep learning algorithms. The images are acquired from a camera using OpenCV camera handling package in Python. The classification models will be trained using TensorFlow or Caffe Deep Learning libraries.

## Problem Statement

Interest in facial and age recognition grew rapidly in the last decades due to its importance in cutting-edge web and mobile applications. Every day, dozens of personal photos are stored on social media applications, and the need to analyze them will facilitate a better user experience [1]. Uses of such a technology varies from security to identification, and human-machine interactions. The significant advances in this area can produce models that are able to outperform even human abilities [2]. Since many languages have grammatical genders, these models might be capable of using proper linguistic attributes and words when interacting with humans. Such is an example of an adequate solution for a problem in this area [3].

## Objectives

We propose to review the available literature about age and gender classification, the existing algorithms, implementations and applications of this topic. After that, a dataset will be collected, and various image preprocessing techniques will be done using already built packages and libraries, in case that the data is unlabeled, then some tools will be used to achieve that. Next, a pre-built model will be used on the dataset and the performance will be measured. Following that, our own neural network model is to be built and tuned. After that, the model will be deployed on the Android platform, Finally, an extensive testing and quality assurance measures is to be applied on the application.

# Planned Schedule

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Week | Tasks and events | Description | Deliverables | Date of Submission | Weight |
| 2 | Research literature    Get familiar with necessary tools and libraries | Understand the scope of the problem, and the environment that will be used in the project. | None |  |  |
| 3 | Data Collection  Performing basic image processing techniques. |  | Initial Plan Document | 8/2 | 5% |
| 4 | Requirement specification  Incremental development plan | Detailed incremental development iterations plan (involves feature implementation plan) | Requirements Document  Detailed Plan | 15/2 | 15% |
| 5-8 | Analysis, tuning and testing of DNN model |  | Initial release  Version 0.1 | 15/3 | 20% |
| 9 | Progress report | A written report about the achieved work | Progress report | 22/3 | 10% |
| 10-11 | Deployment on Android |  | Release 0.2 | 5/4 | 10% |
| 12-13 | Finalization and Testing |  |  | 19/4 |  |
| 14-15 |  |  | First version, Version 1.0 | 3/5 | 20% |
| Project Report Presentation |  |  | 3/5 | 15% |
| Project Videos (3-5 minutes) |  |  | 3/5 | 5% |

# Team Contribution

|  |  |  |
| --- | --- | --- |
| ID | Name | Tasks |
| 201351850 | Mustafa Al-Turki | Resources collection, proposed the initial plan, provided the objectives |
| 201381710 | Majed Alshaibani | Problem Statement, Review Initial Plan |
| 201379790 | Haitham Albetairi | Cover Page, Proofreading & Revision |

# References

[1] Convolutional Neural Networks for Age and Gender Classification, Ari Ekmekji, <http://cs231n.stanford.edu/reports/2016/pdfs/003_Report.pdf>

[2] DAGER: Deep Age, Gender and Emotion Recognition using Convolutional Neural Network, [arXiv:1702.04280](https://arxiv.org/abs/1702.04280)

[3] Age and Gender Classification using Convolutional Neural Networks <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.722.9654&rep=rep1&type=pdf>