**Project proposal**

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**Title of the study:**Age and gender prediction using Deep learning with Keras and Tensor flow.

**Statement of the problem:**

The accurate prediction of age and gender from facial images is a complex problem with applications in various domains, including marketing, healthcare, and security. Existing methods often face challenges in achieving high accuracy due to the complexity of facial features and diverse demographic characteristics. This project aims to address these challenges by leveraging state-of-the-art deep learning techniques implemented using Keras and TensorFlow.

**Justification for and significance of the study:**

In exploring "Age and Gender Prediction using Keras and TensorFlow in Deep Learning," this project is rooted in the need for better ways to guess people's age and gender from their faces. Traditional methods have struggled with the complexity of facial features and the differences among people. By using Keras and TensorFlow, we hope to improve how accurately we can guess someone's age and gender. This study believes that deep learning can unlock patterns in facial data better than older methods. It's not just about making accurate guesses—it's about understanding people better through their faces in a smart and ethical way.

**Design:**

Data collection 🡪 Data preprocessing 🡪 features extraction 🡪 Building the model 🡪Train and Test the model 🡪 Evaluation🡪Results display.

**Methodology:**

This section outlines the practical steps involved in conducting the "Age and Gender Prediction using Keras and TensorFlow in Deep Learning" study.

1. **Resources and Tools:**
   * Identify computing resources and use suitable integrated development environments (IDEs) like Jupyter Notebooks, Visual studios.
   * Ensure access to a reliable internet connection for data retrieval and framework updates.
2. **Data Collection:**
   * Assemble a diverse dataset of facial images with age and gender labels.
   * Prioritize ethical considerations, obtaining proper consent and ensuring privacy measures.
   * Validate the dataset for quality, diversity, and representativeness.
3. **Machine Learning Techniques:**
   * Implement deep learning techniques with the Keras and TensorFlow frameworks.
   * Design tailored convolutional neural network (CNN) architectures for age and gender prediction.
   * Explore different neural network configurations, including layer architectures and optimization algorithms.
4. **Analysis:**
   * Evaluate model performance using key metrics like accuracy, precision, recall, and F1 score.
   * Utilize visualization tools for interpreting model outputs, including confusion matrices and ROC curves.
   * Conduct a thorough analysis of predictions, addressing ethical considerations related to privacy, fairness, and transparency.

**References**:

1.https://paperswithcode.com/paper/vggface2-a-dataset-for-recognising-faces

2.https://www.sciencedirect.com/science/article/pii/S1877050923000546

3.https://paperswithcode.com/paper/learning-face-representation-from-scratch