

Project Progress Report: Keystroke Biometrics and Machine Learning for Real-Time User Validation

Group: 12

Accomplishments:

1. **Keystroke Data Collection:** We successfully implemented a keystroke data collection script using Python. This was integrated into an executable that efficiently captures key press information, including the pressed key, milliseconds between consecutive key presses, and the associated user's name. The collected data is saved to a csv file for the machine learning model to use.
2. **Neural Network Development:** Utilizing TensorFlow and Python, we established a neural network capable of learning from the collected typing datasets. The model is trained to predict whether the incoming typing data matches the patterns it was trained on.
3. **Proof of Concept Setup:** We implemented a basic proof of concept with a React frontend and a Node.js backend. This setup allows us to demonstrate of our approach for user validation. The system incorporates the trained neural network to make predictions based on the incoming typing data.

Next Steps:

1. **Data Collection Expansion:** The upcoming phase involves gathering a more diverse set of typing data from various individuals. This expansion is crucial to enhancing the model's accuracy and ensuring its effectiveness across a broad user base.
2. **API Development with FastAPI:** We plan to develop an API using FastAPI that integrates the trained machine learning model. This API will serve as the interface for user validation requests, allowing individuals to submit their typing data and receive real-time validation responses.
3. **Integration and Testing:** Once the API is developed, we will integrate it into our existing proof of concept. From there we can begin testing to assess the system's performance, accuracy, and responsiveness.
4. **Documentation and User Guidelines:** Simultaneously, we will work on comprehensive documentation and user guidelines to facilitate the seamless integration of our solution into different environments. This will ensure that users can implement and leverage our technology effectively.

Conclusion:

The project is advancing steadily, with key components in place and a clear roadmap for the next steps.