

AI Based Flutter Interface Generator Using Natural Language Commands with Social and Ethical Considerations

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The accelerated pace of development of Artificial Intelligence (AI) and the emerging opportunities to automate the generation of user interfaces (UI) are explored in this research, especially within the context of cross-platform development tools like the Flutter platform. This research aimed to develop customized and open access LLM models, to create User Interfaces (UI) effectively. Then, the social and ethical implications of AI based UI design creation were assessed through a questionnaire survey. The new framework combines all free-tier Large Language Models (Gemini, Groq, Cohere, Hugging Face, Open Router) with individually developed models created via MPNet-Base sentence transformers. The individually developed model performed training on newly developed data sets of 10,000 samples, defining varied UI designs such as authentication pages, dashboards, form elements, and e-commerce UI designs. The new framework allows real-time generation of UI source code for both texts and voice commands developed via Flutter and Python FastAPI development tools. The methodology to evaluate technological advancements utilized performance assessment and conducting surveys to measure UI source-code accuracy and related social-ethical perceptions from 220 IT professionals. The new framework resulted in 87.01% accuracy and 93.31% F1 scores. Analysis disclosed major defects such as pattern repetition, color contrast issues, and incongruent points as significantly prioritized among IT professionals. The new framework showed technological feasibility along with justified needs to introduce social and ethical considerations to ensure greater monitoring and human control in generating UI via AIs.

Keywords: *AI-generated Interfaces, Flutter, Natural Language Processing, Social and Ethical Considerations, Large Language Models*