

INTELLIFIX: AI-POWERED PROGRAMMING ERROR ASSISTANT

TEAM MEMBERS

Nguyen Viet Quan
Nguyen The Bao Ngoc
Tran Ngoc Minh
Dinh Ngoc Minh
Nguyen Quang Phu

SUPERVISORS

Dr. Phong Ngo
Dr. Anh Nguyen

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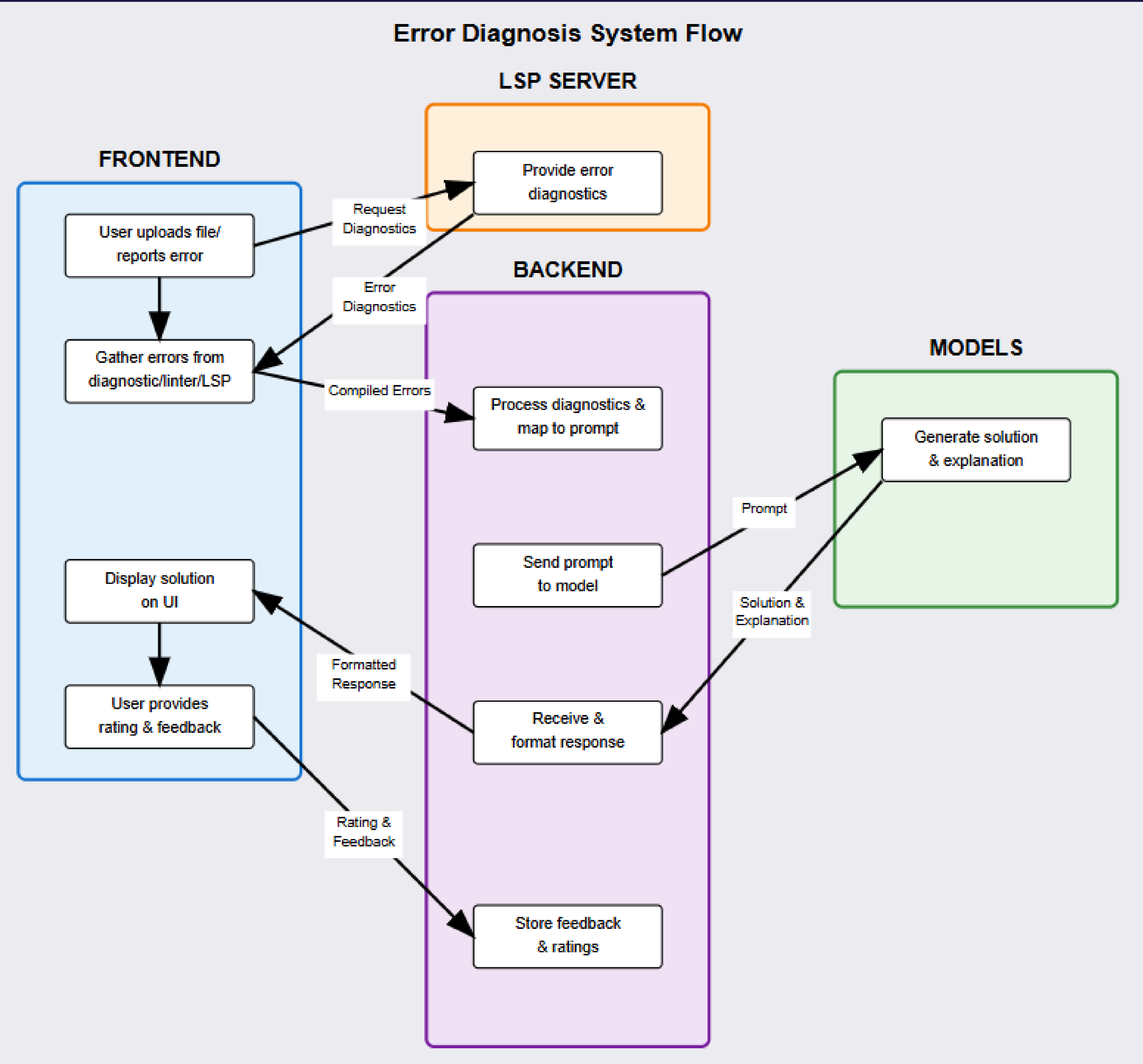
FUTURE WORK

- Implement MLOps flow to keep improving models performance.
- Expand to different IDEs
- Expand dataset to more languages

DESCRIPTION

IntelliFix transforms how students learn programming by making cryptic syntax errors understandable and actionable. Our solution uses Large Language Models (LLMs) and machine learning to provide clear, educational explanations and practical fixes for programming errors. We also provides a dataset of more than 160,000 records with structured format and our trained model to lessen the dependence on external LLMs.

Software Workflow



Performance Metrics Comparison: Before vs After Fine-tuning				
Metric	Before Fine-tune	After Fine-tune	Improvement	Description
BLEU Score	0.32	0.57	+78.1%	Measures n-gram similarity between output and ground truth
CodeBLEU	0.40	0.65	+62.5%	Extended BLEU for source code: syntax, AST structure, and data flow
Exact Match (EM)	21%	45%	+114.3%	Percentage of outputs that exactly match the correct code
Inference Time	~5.6s	~5.8s	+3.6%	Time to generate results for each input
Syntax Accuracy	67%	88%	+31.3%	Percentage of output code without syntax errors
Semantic Accuracy	49%	72%	+46.9%	Percentage of fixes that are correct in logic, not just syntax

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