

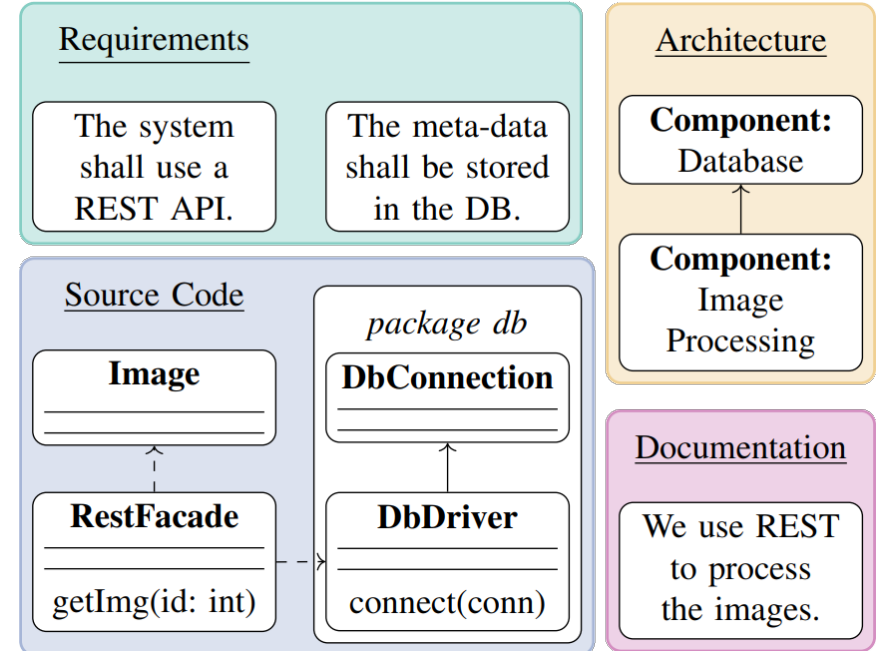
Automated Prompt Engineering for Traceability Link Recovery

Proposal Presentation by Daniel Schwab



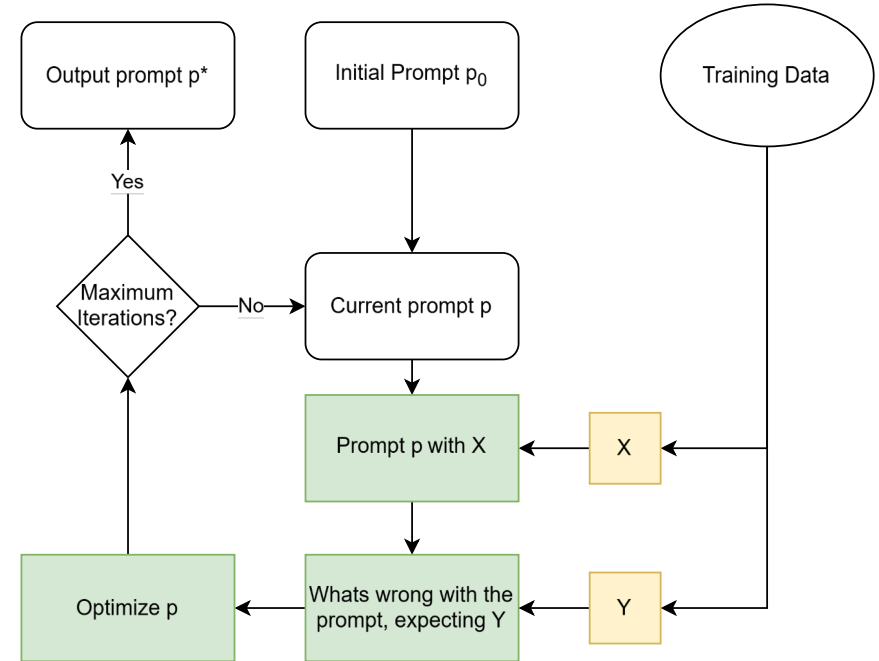
What is Trace Link Recovery

- Many different artifacts are created during software development
- Often inconsistencies will be present, such as naming
- Goal: Link elements across multiple domains or versions to ensure consistency and validation

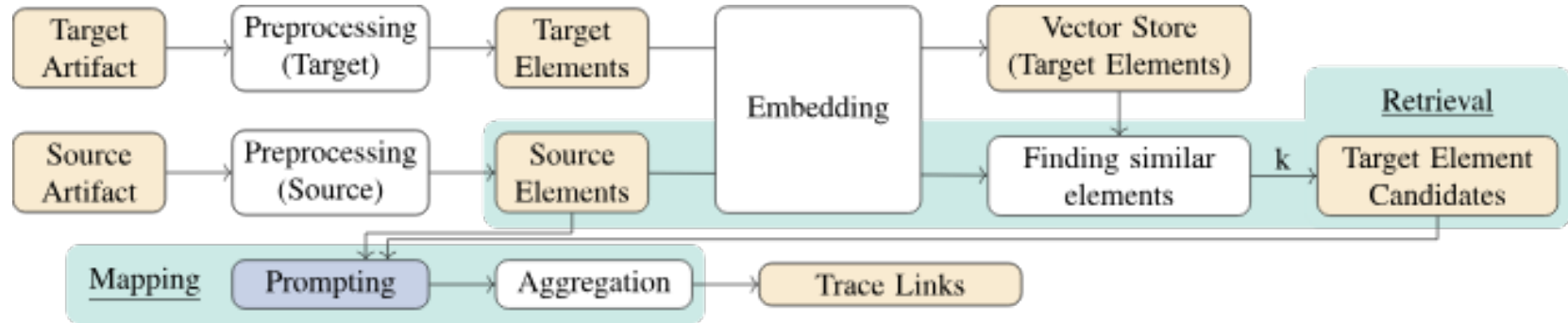


What is Automated Prompt Engineering

- Use the LLM to refine prompts instead of manually formulating them
- Improve initial prompt by training with a subset of the actual data
- Optimization prompt to fix previous shortcomings



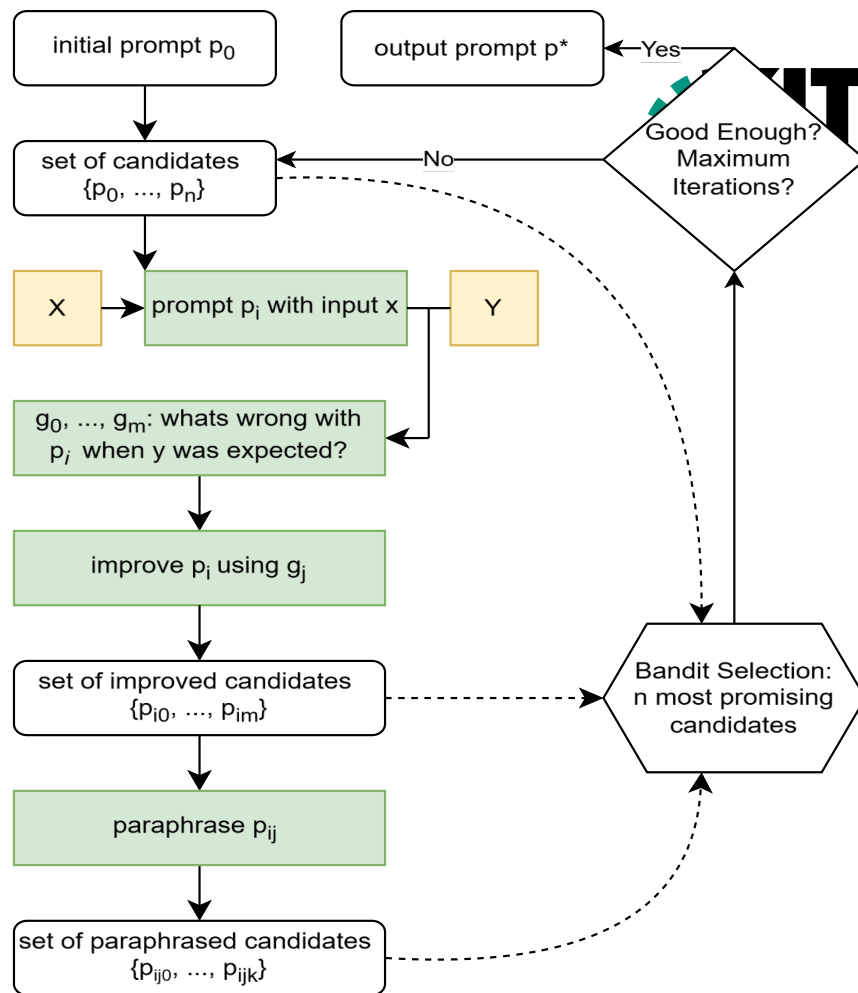
The LiSSA-Framework



- My work will add to the prompting step of the LiSSA framework

APE with Gradient Descent

- Generate many new prompt candidates on each layer
- Steer them against the error direction using gradients
- Select most promising candidates cheaply using a well studied multiple-armed-bandit algorithm



Evaluation

- Compare performance (precision, recall, F1-score, F2-score) against current manually designed zero-shot and chain-of-thought prompt
- Apply variations of different initial prompts and different LLMs to the optimization problem and compare outputs

Sources