Tech Pack Automation Workflow:
Automating Garment Design Specification Using Generative Models

HE, Wenqian
Supervised by Dr. DI, Shimin and Mr. YIP, Teddy

THE DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING
計算機科學及工程學系

Introduction

Problem
- Garment designers need to provide specifications in terms of sketch, material and measurement of a piece garment in a file called "**Tech Pack**" in order for the manufacturers to produce it.
- The creation to completion of the file:
  - **Time consuming** which can take days or weeks sometimes.
  - **Manual and Repetitive** which are done for similar garments before.
- No product in the current market to automate Tech Pack creation process comprehensively.

Solution
- A workflow is built to generate Tech Pack from a garment design using generative models.
  - Components include **sketches**, **materials**, and **measurements**.

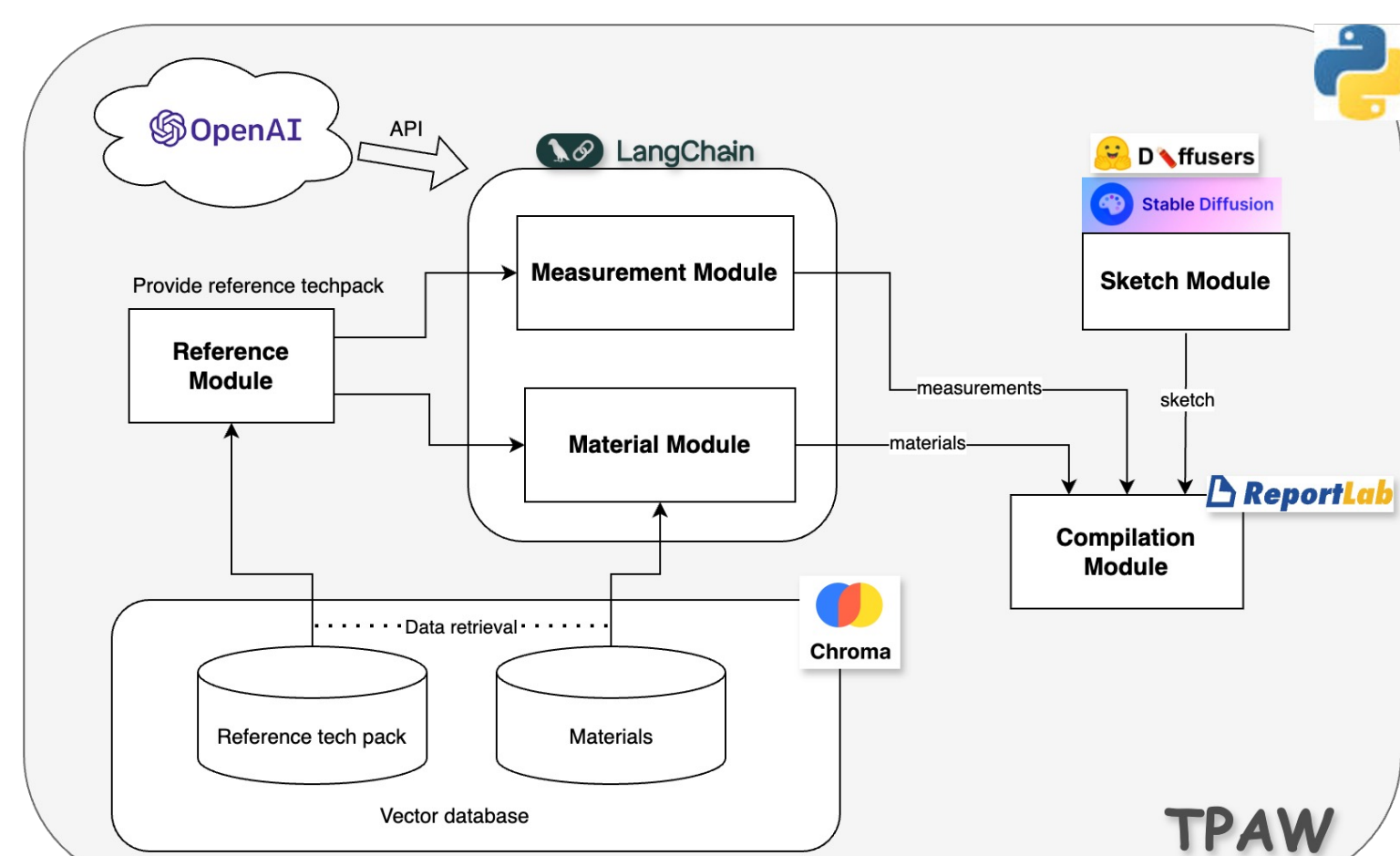### Objectives of Tech Pack Automation Workflow
- To generate garment sketch.
- To make suggestion for garment materials for manufacturers.
- To suggest garment measurements as well.
- To implement a tool to compile tech pack PDF file.

Methodology

Here are some key ideas on design and implementation:
1. Fine-tune Stable Diffusion XL and generate sketch with ControlNet.
2. Parse and store historical tech packs into vector database, then retrieve similar ones as reference for materials and few-shot learning examples.
3. Generate material and measurement data step by step using large language model, such as gpt-4o from OpenAI.
4. Construct material database by materials appeared in historical tech packs. The suggested list of materials must be selected from the material database.
5. Use Gradio to build prototype app.

Methodology

System architecture

Conclusion

Workflow
We built a workflow that automates the following works for designers:
- Draw garment sketch
- Search similar historical tech pack for reference
- Source garment materials
- Decide garment measurements
- Compile all specification into PDF file as tech pack

The designer provide garment design   *The workflow generate sketch from it.*

Conclusion

[Material] Use polyester fabric for main body.
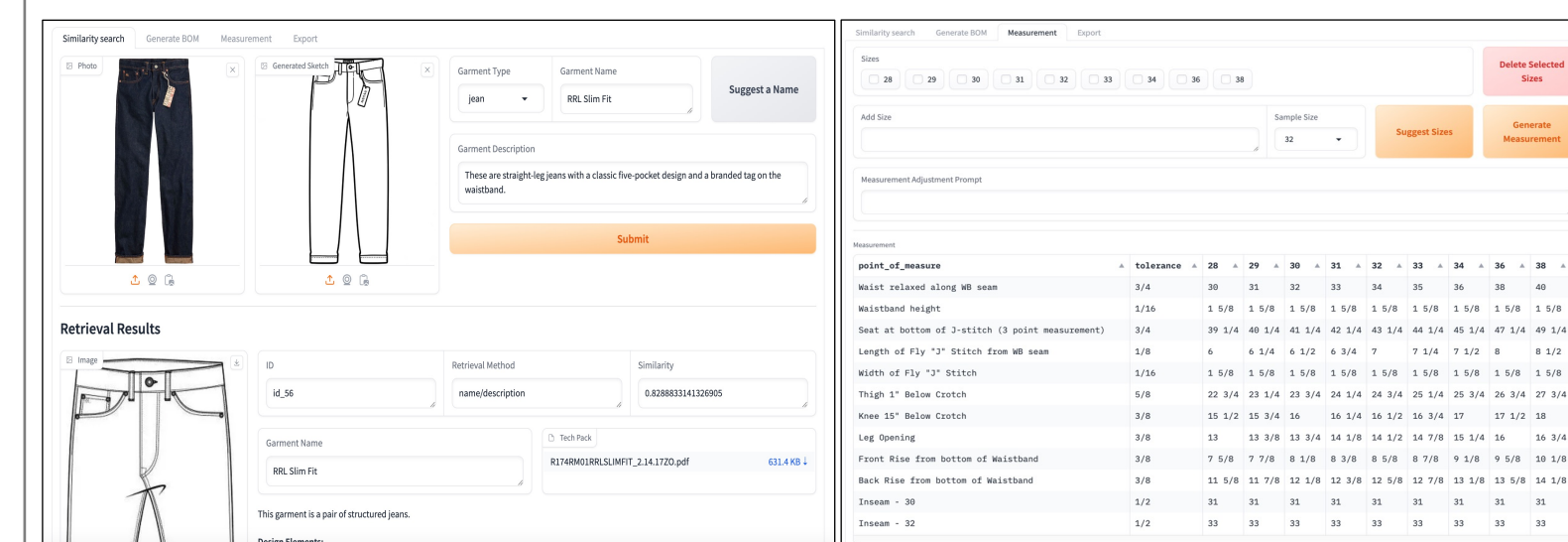[Measurement] Make this jean slimmer.

The designer provide design and preference, the workflow source materials and decide measurements.

All data can be exported into PDF file for designers to submit to manufacturer.

Prototype
A web app was built with Gradio to demonstrate the whole workflow to generate tech pack.

Pages in the prototype web app.