Machine Learning Hub for Tapis

Dhanny Indrakusuma
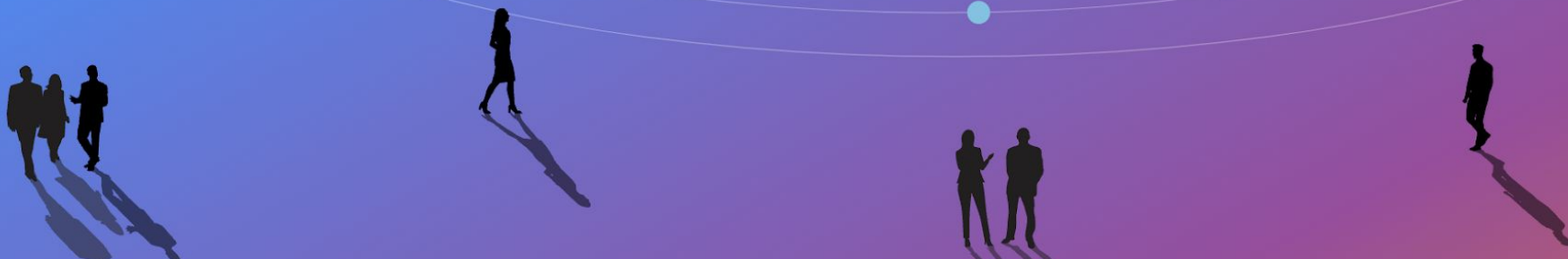SGX3 Summer Internship Report
August 3, 2023

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Introduction

Dhanny Indrakusuma
Software Engineering Intern

M.S.I.S. Student: Applied ML & AI
School of Information, The University of Texas at Austin

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ACI Team

Joe Stubbs, PhD
Research Associate, Manager

Anagha Jamthe, PhD
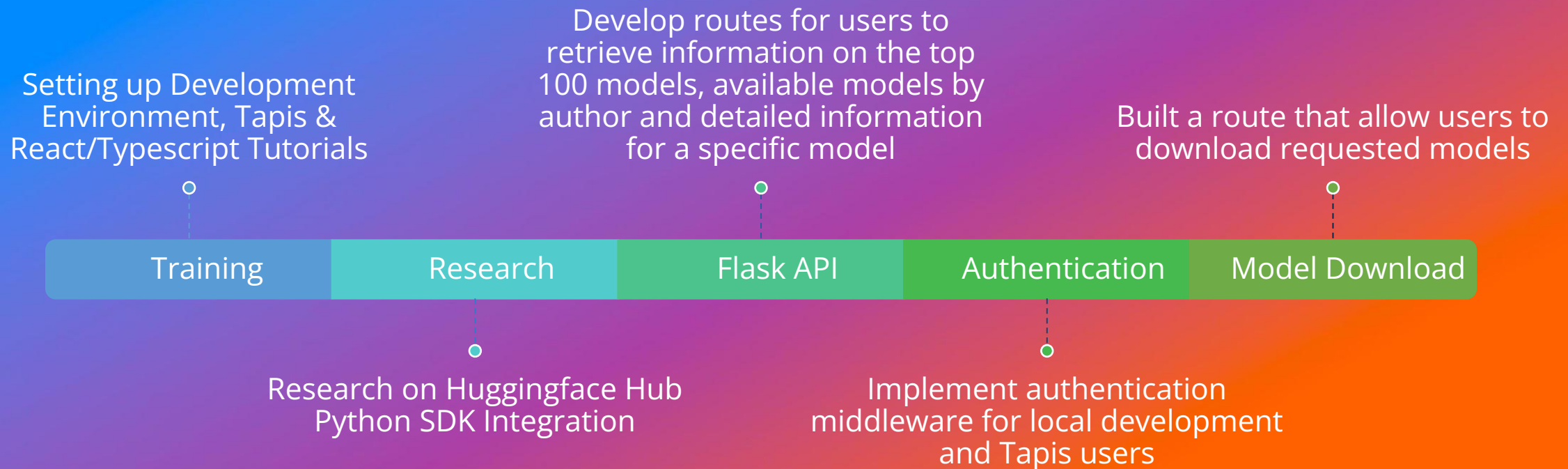Research Associate

Nathan Freeman
POC, Engineering Scientist
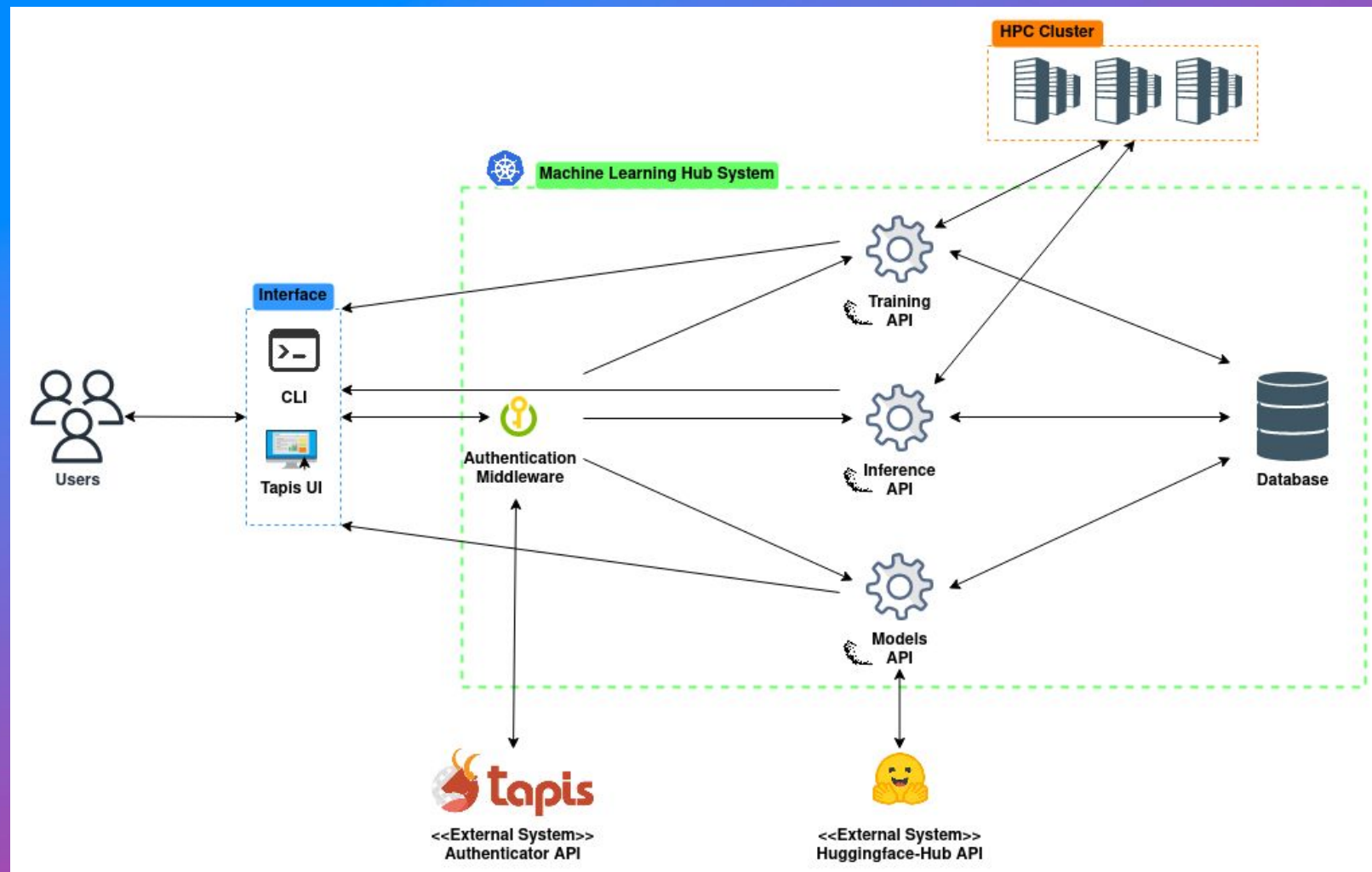Associate

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Project Goals

- Machine Learning Hub REST API as part of Tapis

- Integrate Huggingface Python SDK

- Create Models API for non-technical Tapis users

- Authenticate Tapis users for API usage

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Tasks Timeline

Setting up Development
Environment, Tapis &
React/Typescript Tutorials

Develop routes for users to
retrieve information on the top
100 models, available models by
author and detailed information
for a specific model

Built a route that allow users to
download requested models

Training	Research	Flask API	Authentication	Model Download

Research on Huggingface Hub
Python SDK Integration

Implement authentication
middleware for local development
and Tapis users

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System Architecture

Models API

- Tapis Python SDK for authentication

- Huggingface Hub Python SDK integration

- 5 endpoints:

  - local development authentication

  - ML models information

  - ML model download

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Demo: Models API

Challenges

- Starting a large-scale software project from the beginning

- Integrate Tapis authentication

- REST API design

- Returning downloaded model to user

Learnings

- Best practices in structuring large software project

- Version control & code review

- Testing API using Postman

- Advanced Flask functionality & REST API concepts

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"Magic" moment

- Insight into back-end development

- Get to know how software engineers work

- Being a tourist in my own city

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Next Steps - Fall 2023

- Develop Inference API

- Implement Training API

- Deploy application in the Tapis Kubernetes Cluster

- Connect Flask back-end to Tapis UI's React/Typescript front-end

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Thank You

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https://sciencegateways.org/

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