

# ASLytics

Bridging the Knowledge Gap for the Deaf and Hard-of-Hearing Community

RBC BOREALIS

## RBC Borealis: Let's Solve It! Program 2025

### Team Members:

- Ellie (Yi-Ting) Chang
- Napasorn Kao-ian
- Japleen Kaur

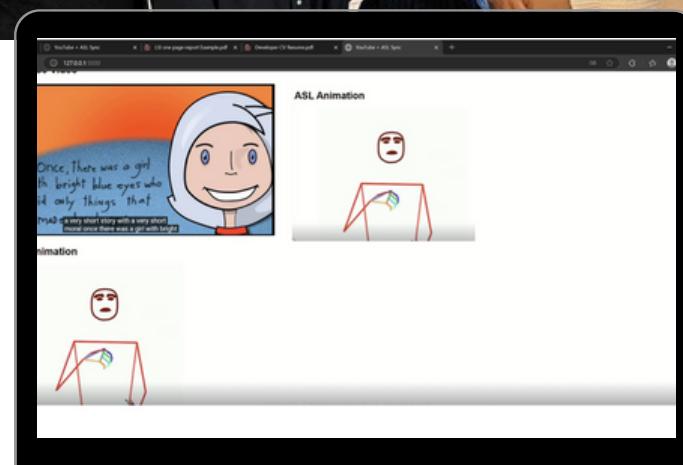
### Mentors:

- Edwin Ng
- Ajay Joy



### Problem:

Despite over 5 billion YouTube videos being watched daily, very few provide sign language support. Since ASL is the first language for many Deaf users—and studies show that over 84% of Deaf children struggle to keep up with caption speed—Deaf and hard-of-hearing individuals remain significantly excluded from fully accessing and understanding online video content.



### What We Aim to Do:

ASLytics is a full-stack AI-powered YouTube extension that transforms English captions into real-time ASL animations, providing the Deaf and hard-of-hearing community with equitable access to learning, information, and entertainment.

### Our Pipeline of Solution:

TEXT → GLOSS → POSE → VIDEO

"What is your name?"



**[“your”, “name”, “what”]**



### Dataset:

Custom pose-based ASL vocabulary dataset with 4,400+ word-level signs scraped from ASL Signbank and Signing Savvy, converted into joint-coordinate pose files using open-source sign language processing tools (educational, non-commercial use).

### Modular AI Pipeline:

- Text → Gloss: English to ASL grammar (SignSpeech)
- Gloss → Pose: Gloss sequences to 3D joint positions
- Pose → Video: Pose animation to MP4 with caption timing

### The Success of ASLytics:

We thank the RBC Borealis Let's Solve It! Program 2025 and its mentors for their support over three months, contributing to a successful LSI Demo Day 2025 presentation. Our team was also honored to be selected to present at the RBC Race for Kids 2025 event.

**GitHub**



**RBC Post**



# SCB Summer Internship

SkillGap Platform: An AI-powered platform that helps interns identify skill gaps while enabling mentors and HR to track intern skills and readiness in real time.



The screenshot shows a user profile page titled "My Skill Page". It features a "Skill Progress Bar" comparing "Skills Required" (Python, PowerAutomate, PowerApps, Excel) with "Skills Achieved" (PowerApps, Excel). A "My Skill Gap" section lists gaps in Python, PowerAutomate, and Excel. Below this is an "Intern Skill Analysis" section showing "Analyzed Unachieved Skills" (PowerApps) and "Areas for Improvement to Develop Before the Internship Begins" (based on project requirements and intern's self-assessment). A sidebar offers "Read about my project" and "Read my profile" options, along with a "Recommend Courses" section listing various Microsoft training modules.

## Skill Gap Platform

### Problem:

A survey of the 2025 summer interns shows that 43% rated task understanding and 45% rated skill readiness at Level 3, while over 50% rated curiosity and desire to learn at Level 5. This reveals a gap between high motivation and moderate readiness. Additionally, HR processes rely on manual skill evaluation and frequent pre-onboarding coordination, leading to inefficiencies.

### Solution:

We developed an AI-powered platform where interns log in using their credentials to identify skill gaps, while HR tracks intern skills and readiness in real time. The platform uses AI to analyze intern profiles, support mentor-intern matching, and streamline project communication through an automated email system.

### Technology:



The screenshot shows the "Intern Skill Analysis" interface. It displays an "Intern Profile" for "Nopparorn Kao-luck SCB Academy" with status "in progress" and "Fullname: Nopparorn Kao-luck Email: nopparkao.luck@gmail.com". To the right, there's an "Intern Project" section for "Personalized Skills Development Platform" with "Start Date: 6/4/2025", "End Date: 7/10/2025", and a "Project Name: Group-project final presentation". Below these are buttons for "ANALYZE", "Report Interns", "SAVE", and "Remind Mentor".

The screenshot shows the "Prompt Tank" platform's "Prompt Builder" interface. It includes fields for "Purpose" (e.g., "Marketing"), "Context" (e.g., "Creating content for an eco-conscious travel website aimed at promoting sustainable tourism practices"), and "Role" (e.g., "An experienced travel writer and sustainability advocate with expertise in eco-tourism"). A "Generate" button is at the bottom left, and a "Copy" button is at the bottom right.

## Prompt Tank

### Problem:

In a banking environment, employees often struggle to craft effective AI prompts, leading to reduced productivity. While a one-day internal workshop exists, it is insufficient for long-term skill development.

### Solution:

PromptTank is an AI-powered prompt platform that helps employees quickly create, discover, and share high-quality prompts. Users input their intent through a structured format, which is transformed into an optimized prompt using SCB's in-house AI. The platform also provides a searchable prompt repository, standardized prompt templates, and a prompt showcase to promote reuse and knowledge sharing across the bank.



### Learning Outcomes:

The SCB Summer Internship 2025 provided me with the opportunity to contribute to Thailand's largest financial institution. Over the two-month program, I quickly adapted to new tools and workflows designed to ensure that all data and operations remained within the bank's secure environment. This experience deepened my understanding of data security, cloud data management, and integrating platforms with internal AI APIs. I am especially grateful to the HR team for their guidance in an Agile working environment, and to my colleagues whose collaboration made these projects possible.



# PitchSafe

Empowering baseball pitchers and coaches with data-driven insights to prevent injuries and optimize performance.



Computer Science  
UNIVERSITY OF TORONTO



## Focus in Technology Leadership 2025

Supervised by BaiT (Toronto Startup by [Nick Seelert](#))

### Team Members:

Japleen K. | Derek Y. | Lihi G. | Abhinn K. | Napasorn K.

### Professors:

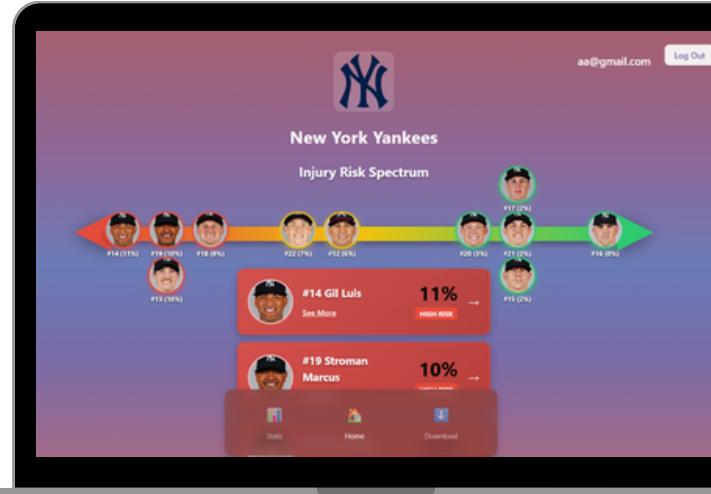
Paul Gries & Michael McCarthy.

### Problem:

Pitcher injuries are rising at all levels due to overuse and fatigue: ~25% of MLB pitchers undergo Tommy John surgery, and youth injuries have increased 500% in 20 years. Current approaches are reactive, relying on manual tracking, inconsistent monitoring, and limited tools—leaving coaches without early.

### Solution:

Pitch Safe helps coaches use real-time data and machine learning to predict injury risk and manage pitcher workloads.



### Tech Stack

#### Architecture:

PitchSafe uses Clean Architecture, separating domain, application, and infrastructure layers for scalability, testability, and maintainability. Frontend and backend follow mirrored layer-based structures with clear boundaries between UI, logic, data, and ML systems.



#### Backend:

Node.js · Express · PostgreSQL (Supabase) · Python / scikit-learn · Jest (300+ tests)

#### Frontend:

React · Vite · Recharts · Clean Architecture

#### Infrastructure:

Supabase · GitHub Actions (CI/CD) · Local PostgreSQL

### Learning Outcomes:

I applied my foundational knowledge to fully implement a cloud-based platform built primarily with React.js. I also gained hands-on experience using Docker containers to run the project and deploy new features more efficiently within a team environment.

#### GitHub

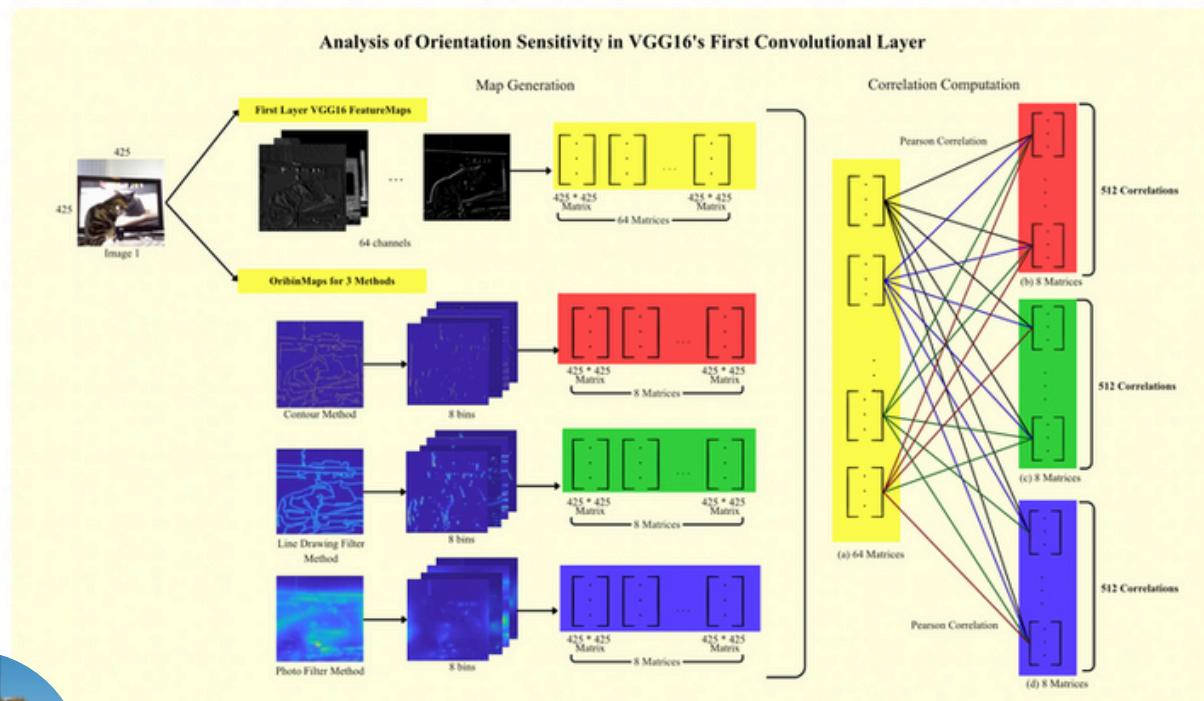


#### Video





## Decoding Neural Networks: Analyzing Alignment Between CNN Feature Detection and Human Visual Perception



I am currently exploring the alignment between convolutional neural network (CNN) feature detection and human visual perception, working closely with **Seohee Han** under the supervision of **Professor Dirk Bernhardt-Walther**.

In this project, we conduct a **large-scale quantitative analysis** of how **orientation information** is encoded in the first and last convolutional layers of CNNs. Using over **73,000** natural images, we extracted **feature maps** from early (64 channels) and late (512 channels) layers and compared them against orientation-specific representations generated through contour, line-drawing, and photo-based **image-processing pipelines**. By computing Pearson correlations across orientation bins spanning  $180^\circ$ , we characterized orientation-tuning profiles for individual CNN channels, offering insights into how low- and high-level visual features relate to principles of **biological vision**.

Beyond the research findings, this work significantly strengthened my technical skills in handling large-scale image datasets, optimizing computational pipelines, and **reducing runtime** without compromising **analytical validity**. I learned to balance efficiency and accuracy by carefully structuring data workflows, validating intermediate outputs, and ensuring that performance optimizations did not distort results, an experience that deepened both my research rigor and engineering mindset.

### Tech Tools

