# Diwen Huang

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## Technical Skills

**Languages:** Python, Swift, Kotlin, TypeScript, JavaScript, Java, C++, SQL, HTML/CSS
**Frameworks & Tools:** SwiftUI, React, React Native, Next.js, Tailwind CSS, FastAPI, Firebase, Supabase, Docker, Fly.io, Tailscale, Git, GCP, Android Studio, Figma, Bash
**Machine Learning:** TensorFlow, PyTorch, NumPy, SciPy, scikit-learn, CoreML, OpenCV, YOLOv5, TrackNet, ONNX, CUDA, Kalman Filtering

## Experience

### Clutch
*Machine Learning Intern* Feb 2026 – Present

- Padel and pickleball court keypoint detection system using a modified TrackNet heatmap-regression CNN; achieved **98.46%** accuracy with homography-based recovery of occluded keypoints; deployed as FastAPI microservice on Fly.io with ONNX inference.
- Engineered pickleball dataset pipeline extracting **9,800+** frames via HTTP stream seeking with stratified sampling; transfer-learned padel model to pickleball across racquet sport domains.
- Badminton match analysis pipeline assembled end-to-end, integrating player tracking, pose estimation, shuttle trajectory, court homography, shot classification, and scoreboard OCR into a unified Docker-based inference system.

*Software Engineer Intern* Nov 2025 – Jan 2026

- Padel coaching search engine built with RAG using OpenAI embeddings and GPT for semantic shot matching, video segmentation, and personalized drill recommendations.

### Smashspeed AI
*Founder & Lead Developer* May 2025 – Present

- Badminton smash speed tracking via real-time CV pipeline for iOS using SwiftUI, YOLOv5, CoreML, and Kalman filtering for on-device inference; achieved **93%** accuracy after hand-labeling and training on **15,000+** images using NVIDIA A100 GPUs on Google Cloud.
- Architected scalable Firebase backend supporting tens of thousands of registered accounts with authentication, cloud storage, and real-time data synchronization.
- Led a **6-person** engineering/design team, scaling to **50,000+** users across **120 countries** and ranking **#1** in Taiwan (Sports), **#2** in Vietnam, and **#4** on Google Play (Sports) through viral campaigns reaching **5M+** views; achieved **34%** conversion rate (industry avg: **2–5%**).

### Solace
*Founding Engineer — backed by UC Berkeley & Virtuals Protocol* Oct 2025 – Present

- Leading mobile and backend development for Solace's AI wellness app using React Native, Supabase, and Fly.io; building voice agent integrations and RESTful APIs alongside scalable auth, data management, and analytics infrastructure.

### Cluely
*Machine Learning Engineer (Contract)* Oct 2025 – Oct 2025

- Developed a privacy-first, local-only gaze tracking system classifying eye/head direction at **15–30 FPS** with **<100ms** latency; implemented swappable detection modules, five-point calibration, and temporal smoothing for CPU-only real-time inference.

## Projects & Research

**Shuttlecock Trajectory & Speed Estimation (Published Research)** May 2025 – Sep 2025

- Authored and published research paper on arXiv presenting novel badminton smash speed algorithms; mentored by **Stanford (PhD, CS)** and **UPenn (MEng, Data Science)** experts.

**devdiwen** | *Educational Content Creator* 2024 – Present

- Producing math and science animations using Manim for Instagram Reels and short-form video; grown to **5,000+** followers and **10M+** views across platforms.

**Steve the Freakysaur** Sep 2025

- Built Chrome Dino–style game controlled hands-free via real-time tongue detection using a segmentation model on webcam input; awarded **1st place** (**124** participants, **50+** projects) at Daydream Game Jam, BC's largest youth hackathon; generated **250,000+** impressions on LinkedIn.

## Education

**Port Moody Secondary School** – IB Diploma Candidate Port Moody, BC
*Expected Graduation: June 2027*

- **Academics: 4.0 GPA**. Pursuing IB Higher Levels in Math AA and Physics.
- **Standardized Tests:** SAT **1540** (**800** Math, **740** English).
- **Certifications & Coursework:** Deep Learning Specialization (Coursera), Google UX Design Specialization (Coursera), Linear Algebra & Multivariate Calculus (Imperial College London).