# CHI-YAO HUANG

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## EDUCATION

- **Arizona State University (ASU)** — Tempe, AZ
  *Ph.D in Computer Science* — *Current*

- **Arizona State University (ASU)** — Tempe, AZ
  *M.S. in Robotics and Autonomous Systems (AI Track); GPA: 4.00/4.00* — *Aug 2021 – May 2023*

- **National Taiwan University (NTU)** — Taipei, Taiwan
  *M.S. in Mechanical Engineering; GPA: 3.83/4.3* — *Sep 2015 – Jun 2017*

- **National Sun Yat-Sen University (NSYSU)** — Kaohsiung, Taiwan
  *B.S. in Mechanical and Electro-Mechanical Engineering* — *Sep 2010 – Jun 2014*

## EXPERIENCE

- **Arizona State University (ASU)** — Tempe, AZ
  *Research Assistant - Prof. Yezhou Yang* — *Aug 2021 – Current*
  - **Domain Expansion: Active Latent Space Construction for Spatial Intelligence:** Enabled spatial intelligence by actively structuring the latent space to embed multiple spatial concepts within a unified representation.
  - **VOCAL: Visual Odometry via ContrAstive Learning(arXiv):** Integrated Bayesian inference with representation learning to align similar camera states in a coherent latent space for enhanced multimodal compatibility.
  - **TOYOTA Pose Estimation in Ariel Environments (TRINA):** Developed high-altitude pose estimation for ariel robots using IR and IMU sensors under varying weather conditions.
  - **3D Landmark Reconstruction for Robot Localization and Mapping:** Employed learning-based 3D reconstruction and semantic labeling to enable robots to jointly optimize their trajectory and object poses.

- **Advanced and Creative Team, HTC VIVE (Acquired by Google)** — New Taipei, Taiwan
  *Core Member & Strategic Innovator, Team Lambda (VR/AR Innovations)* — *Sep 2017 – Feb 2021*
  - **Core Contributions:** Played a pivotal role as a core team member—spearheading design reviews, mentoring junior engineers, and driving key technical decisions that shaped breakthrough VR/AR technologies.
  - **VIVE COSMOS:** Developed a multi-camera VR tracking system with 0.4 mm accuracy by utilizing multi-camera Bundle Adjustment and designing a mothership SLAM system for all VR products. Product Overview Demo Video
  - **VIVE FOCUS 3:** Led a team to prototype an MR system integrating gesture and tightly-coupled visual-inertial SLAM tracking, achieving trajectory jitter below 0.1 mm and a 4× speed-up on embedded systems. Product Overview
  - **VIVE FLOW:** Collaborated with hardware and firmware teams to resolve CPU loading and thermal issues in an AR device. Product Overview
  - **Scene:** Engineered a voxel-based obstacle mapping system for VR safety, integrating semantic maps for real-world interactions.

- **NTU Robotics Lab, National Taiwan University** — Taipei, Taiwan
  *Graduate Student and Vice System Manager - Prof. Han-Pang Huang* — *Sep 2015 – Jun 2017*
  - **Master Thesis: 3D Reconstruction and Path Planning with Signed Distance Function:** Fused optical flow with feature points for efficient SLAM; modified bundle adjustment using Lie groups and quaternions; implemented voxel hashing for dense mapping; integrated SLAM with biped robot path planning.
  - **Humanoid Robot:** Designed ZMP trajectories to enable robust biped locomotion on uneven terrains.
  - **Vice System Manager:** Developed orientation materials and managed robotic equipment including robotic arms and mobile robots.

- **Company of Air Defense Artillery Battalion, R.O.C. Army** — Taiwan
  *Battalion Dispatcher* — *Sep 2014 – Sep 2015*
  - **:** Managed hundreds of vehicles and anti-air systems during military exercises.

- **National Sun Yat-Sen University** — Kaohsiung, Taiwan
  *Undergraduate Student - Prof. Yaw-Terng Su* — *Sep 2010 – Jun 2014*
  - **Commercial Vehicle Speed Control System:** Designed a PID controller for vehicle speed regulation.
  - **Stairlift for Elderly People:** Developed a PLC-based stair climbing system to enhance mobility for the elderly.

## Research Areas

- Spatial Intelligence, Visual Odometry, SLAM, 3D Computer Vision, Robotics, Autonomous Systems

## Awards

- **Ira A. Fulton Schools of Engineering Fulton Fellows Award, ASU**

- **Student with Distinction, Arizona State University**

## Skills

- **Programming Languages:** C/C++, Python, JavaScript
- **Libraries & Tools:** OpenCV, Eigen, Ceres, PyTorch, Keras, OpenGL, SIMD, CEVA, Hexagon

## Languages

- Mandarin (Native), English (Fluent)