# ANJU GOPINATH
## PH.D. STUDENT IN COMPUTER VISION & ML

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## PROFESSIONAL SUMMARY

- I am a PhD candidate in Computer Vision and Machine Learning, supervised by Dr. Nikhil Krishnaswamy. I conduct research in the areas of affordances and hand pose estimation. I am also a Graduate Research Assistant at the Colorado State University Energy Institute where I use Machine Learning to quantify methane emissions.
- I have five years of experience as a software developer and a computer vision engineer, working with companies such as Intel, OPPO, and Subex. I have also completed internships at institutions such as the National University of Singapore and the Technische Universität Graz. I also have a master's in computer science from IIT Madras.

## EDUCATION

**COMPUTER SCIENCE / PH.D. /** COLORADO STATE UNIVERSITY / CGPA: 4.0 — **2024**

**COMPUTER SCIENCE / M. TECH /** INDIAN INSTITUTE OF TECHNOLOGY, MADRAS — **2017**

**COMPUTER SCIENCE / B. TECH /** SCMS SCHOOL OF ENGG. AND TECHNOLOGY, KARUKUTTY — **2011**

## RESEARCH AT CSU

### AFFORDANCE PREDICTION

Redefine the existing affordance definition in Computer Vision by bringing it under the umbrella of Gibsonian and telic affordances. As part of this work, I have worked extensively on customizing the VIA annotation tool, developed an annotation software using Python, did python scripting for data preprocessing, used images from HICO-DET and Moments in Time datasets as input for annotations, quantified the habitat of the human object interactions by formulating conditional and joint probabilities using python script, and wrote Python code for object detection and machine learning training.
Skills Used: JavaScript, Python Scripting, PyTorch, PyQt5

## RESEARCH INTERNSHIPS

**3D HAND POSE ESTIMATION** — **May – August 2023**
NATIONAL UNIVERSITY OF SINGAPORE (IN-PERSON)
Worked with Dr. Angela Yao and Ziwei Yu

**3D HAND POSE ESTIMATION** — **June – August 2022**
TECHNISCHE UNIVERSITÄT GRAZ (REMOTE)
Worked with Shreyas Hampali (Dr. Vincent Lepetit's lab)

## WORK EXPERIENCE

**COMPUTER VISION ENGINEER I (REMOTE)** — **March – August 2020**
OPPO US RESEARCH CENTRE, SEATTLE, WASHINGTON

- Improve the performance of computer vision algorithms for video manipulation on mobile phones.
- Skills: C++, Halide

**COMPUTER SCIENCE TUTOR (REMOTE)** — **January – March 2020**
WYZANT AND VARSITY TUTORS

- Tutored students and professionals in Programming (C, C++, Java), Operating Systems, Compilers, Data Structures and Algorithms, Dynamic Programming, Artificial Intelligence etc.

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--- **WORK EXPERIENCE CONTINUED** ---

### IMAGING IP SIMULATION ENGINEER                January 2018 – December 2018
INTEL TECHNOLOGY INDIA PVT. LTD.

- Fix bugs, build entire modules in the imaging pipeline, incorporate C++ coding guidelines and collaborate with team members on good coding practices, build POC models for applying ML to modules etc.
- Was part of a four-member team that visited Eindhoven, Netherlands for knowledge handover to shift the operations to Bangalore, India. It was a good learning experience in terms of team collaboration, fixing complex coding issues and on how to write code from technical specification documents.
- Skills: C++

### POWER AND PERFORMANCE ENGINEER                June 2017 – December 2017
INTEL TECHNOLOGY INDIA PVT. LTD.

- Analyze, debug and resolve performance issues in Intel processors. Implemented two POC's for building an entire database for the Power and Performance team in Intel and built a reporting front end. (1) Mentored a junior to build a front-end using PHP, bootstrap and CodeIgniter framework. (2) The other one was built using the QlikView reporting tool (myself).
- Skills: QlikView Reporting Tool, C++

### SYSTEM ANALYST                July 2011 – June 2012
SUBEX LTD., BANGALORE, INDIA

- Development of customized reports and it's integration into the software for real-time processing.
- Skills: Java, C#, QlikView Reporting Tool

### SOFTWARE DEVELOPMENT ENGINEER                July 2012 – June 2013
SUBEX LTD., BANGALORE, INDIA

- Telecom: Write code to interpret customer's CDRs and incorporate various types of volume agreements, carrier invoices and bill components. Development of customized reports.
- Clients - T-Mobile (Americas), GVT(Brazil), Verizon (Americas), TELUS, ATT etc.
- Skills: Java, QlikView Reporting Tool

### SOFTWARE ENGINEER TRAINEE                July 2013 – June 2014
SUBEX LTD., BANGALORE, INDIA

- Training in Java (3 months)
- Telecom: Writing code for multi-layer network and service discovery, data reconciliation and discrepancy analytics.
- Skills: Java, Talend Reporting Tool

--- **COURSE WORK** ---

- **ALGORITHMS**: Advanced Data Structures and Algorithms (CS5800), Advanced Programming Lab (CS6140).
- **MACHINE LEARNING:** Pattern Recognition (CS6690), Kernel Methods for Pattern Analysis (CS6011), Machine Learning (CS545).

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--- COURSE WORK CONTINUED ---

- **COMPUTER VISION:** Imaging Computation (CS510), Optimization Methods for Computer Vision Applications (CS6777
- **RESEARCH:** Research Seminar - Computer Vision and ML (CS793), Research Seminar - Robotic Grasp with Reinforcement Learning (CS793), Introduction to Research (CS692).
- **OTHERS:** Big Data (CS535), Linear Algebra and Random Processes (CS6015), Cryptography and Network Security (CS6500), Digital System Design and Testable Design (CS6330), Theory and Applications of Ontologies (CS6852).

--- TEACHING ---

- Algorithms Theory and Practice (CS320), CSU- TA For 5 Semesters.
- Digital Logic Design (CS2310), IIT Madras.
- Computer Programming Lab (CS2110), IIT Madras.

--- PUBLICATIONS ---

- Alexander Henlein, **Anju Gopinath**, Nikhil Krishnaswamy, Alexander Mehler, James Pustejovsky. Grounding Human-Object Interaction to Affordance Behavior in Multimodal Datasets, In Frontiers in Artificial Intelligence, Language and Computation Section, Volume 6-2023

--- ACADEMIC SERVICE ---

- Reviewer For IWANN 2023
- Sub-Reviewer for NeurIPS 2023

--- TECHNICAL SKILLS ---

- **LANGUAGES: [**Proficient] - C, C++, OpenCV, Python; [Intermediate] - Java, Halide, MATLAB; [Basic] - JavaScript, HTML.
- **SOFTWARE TOOLS: [**IDEs] - PyCharm, Visual Studio, Visual Studio Code, Eclipse; [Code Collaboration] - Gerrit, Git; [Databases]- PL/SQL, Oracle SQL; [Issue Tracking] - Jira; [Reporting Tool] - Qlikview; [Document Preparation] - Latex; [Computer Vision] - VIA annotation tool

--- MENTORING ---

- **Topics Covered:** Python coding, discussion on how to perform annotations.
  Deliverables: Manual annotations, python script to generate formatted inputs for an ML model.
  Mentees:
  - Aidan Franklin, Jade Collins, Beverly Her, Paige Hansen (all are undergraduate students at Colorado State University).
  - Rahul Ghosh (high school student).
- **Topics Covered:** Building resume, creating LinkedIn profile.
  Deliverables: One mentee built an Android app; all mentees built a resume using Overleaf and created LinkedIn profiles.
  Mentees:
  - Jake Isley, undergraduate student at Colorado State University, November 2020 - May 2021.
  - Logan Harris, undergraduate student at Colorado State University, November 2021 - May 2022.

--- PROFESSIONAL TRAINING WORKSHOPS ---

- Subex – QlikView (Business Reporting Tool).
- Intel - How to Write Clean and Efficient Code, Efficient Debugging Using GDB.

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## LEADERSHIP EXPERIENCE

- VP of Events - Science in Action (Science Communication and Policy group at Colorado State University), 2021-22
- Graduate Events Committee Representative, Computer Science Department, Colorado State University, 2020-21

## VOLUNTEERING

- Student Ambassador (IITM) for YourStory Media, India's no.1 media platform for entrepreneurs. Responsible for writing articles.
- Member of the event organizing committee for ComSciCon RMW 2021 (Science communication workshop for STEM grad students in the Rocky Mountain West region, planned by grad students).

## ACHIEVEMENTS

- School topper in 10th Standard.
- Secured All India Rank 391(99.66 percentile) in GATE-Computer Science, 2015.
- Anchor for two episodes for Kairali TV - selected from school.
- Bahrain ToastMaster Best Speaker Award - twice.
- Certified with A+ for Infosys Campus Connect in college- a soft skills development program.