Akshay L Chandra

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https://akshaychandra.com

Education

- **University of Freiburg** — Freiburg, Germany
  Master of Science in Computer Science (Artificial Intelligence Specialization) — *Oct. 2021 – Present*
- **Indira Gandhi National Open University** — Hyderabad, India
  Post-Graduate Diploma in Applied Statistics, 85%; — *Jul. 2017 – Jun. 2018*
- **Jawaharlal Nehru Technological University** — Hyderabad, India
  Bachelor of Technology in Computer Science & Engineering, 76% (Top 15/300); — *Aug. 2013 – May 2017*

Publications[†]

1. S. Rawat, **Akshay L Chandra**, S.V. Desai, Vineeth N Balasubramanian, S. Ninomiya, Wei Guo. How Useful is Active Learning for Plant Organ Segmentation. Under Single-Blind Review 2021.

2. **Akshay L Chandra**, S.V. Desai, C. Devaguptapu, Vineeth N Balasubramanian. On Initial Pools for Deep Active Learning. NeurIPS 2020 Workshop on Pre-registration in Machine Learning. Proceedings of Machine Learning Research 2021.

3. **Akshay L Chandra**, S.V. Desai, Vineeth N Balasubramanian, S. Ninomiya, Wei Guo. Active Learning with Point Supervision for Cost-Effective Panicle Detection in Cereal Crops. BioMed Central Plant Methods 2020. *[Impact Factor: 4.5]*

4. **Akshay L Chandra**, S.V. Desai, Wei Guo, S. Ninomiya, Vineeth N Balasubramanian. An Adaptive Supervision Framework for Active Learning in Object Detection. British Machine Vision Conference (**BMVC**) 2019.

5. **Akshay L Chandra**, S.V. Desai, Vineeth N Balasubramanian, S. Ninomiya, Wei Guo. EasyRFP: An Easy to Use Edge Computing Toolkit for Real-Time Field Phenotyping. CVPPP Workshop at ECCV 2020.

6. **Akshay L Chandra**, S.V. Desai, Vineeth N Balasubramanian, S. Ninomiya, Wei Guo. Computer Vision with Deep Learning for Plant Phenotyping in Agriculture: A Survey. ACCS Journal India 2020.

Research/Work Experience

- **Indian Institute Of Technology Hyderabad** — Hyderabad, India
  Research Assistant, Lab1055 (Machine Learning and Vision Lab) — *Dec 2018 - Present*
  - Working under the guidance of **Dr. Vineeth N Balasubramanian**, mainly in the intersection of computer vision, deep active learning, object detection, semantic segmentation and plant phenotyping, frequently collaborating with **Dr. Wei Guo** from University of Tokyo. Please see Research Projects section for full details.
- **GGK Technologies (ACS Corp.)** — Hyderabad, India
  Associate Software Engineer, AI/ML (R&D) Team — *June 2017 - Sept 2018*
  - Optimized business processes for clients in health care, retail, e-commerce by building useful prediction models, capturing customer/patient behavior patterns. Exclusively worked on building an accelerated computer vision application that detects product pickups in a retail store from the CCTV footage.
  - Won **Best Trainee** and **Best Employee** awards during my time at the company.

[†]Not in any specific order. I share joint first authorship with my colleagues in some of these works. Please see my website for clarity.

RESEARCH PROJECTS

- **Domain Adaptation with Synthetic and Real Data for Plant Phenotyping** *July 2021 - Present*
  Advisor: Dr. Vineeth N Balasubramanian (IIT Hyderabad) & Dr. Wei Guo (UTokyo)
  - Working towards creating a framework that can allow plant researchers to create datasets with realistic synthetic attributes like fog, light/no-light, water, etc.

- **Active Learning for Semantic Segmentation** *July 2020 - Present*
  Advisor: Dr. Vineeth N Balasubramanian (IIT Hyderabad)
  - Working towards making active learning learnable and transferable with deep Q-networks (DQN).
  - This work is being done as part of a collaboration between IIT Hyderabad and NVIDIA India.
  - A parallel work on plant segmentation is underway, supervised by Prof. Wei Guo (UTokyo).

- **On Initial Pools for Deep Active Learning** *Nov 2020 - Apr 2021*
  Advisor: Dr. Vineeth N Balasubramanian (IIT Hyderabad)
  - Currently working towards exploiting self-supervised methods to intelligently select initial pools for active learning in a completely unsupervised fashion. The goal is to find *good init* in data space. Our proposal and experiments were accepted Preregistration workshop at NeurIPS 2020.

- **Edge Computing Toolkit for Field Phenotyping** *June 2020 - Aug 2020*
  Advisors: Dr. Vineeth N Balasubramanian (IIT Hyderabad) & Dr. Wei Guo (UTokyo)
  - We built a Flask back-end, AngularJS front-end edge computing toolkit for real-time field phenotyping that can work on any GPU based edge devices such as NVIDIA Jetson Xavier.
  - Our lightweight but adaptable toolkit allows field phenotyping researchers to seamlessly deploy and monitor their models' performances on the go.
  - This work was accepted at CVPPP Workshop, ECCV 2020. Code: https://github.com/lab1055/easy-rfp.

- **Deep Active Learning for Object Detection** *Dec 2018 - Oct 2019*
  Advisors: Dr. Vineeth N Balasubramanian (IIT Hyderabad) & Dr. Wei Guo (UTokyo)
  - We were able to design a framework that allows the detection model to specifically query for what it needs, either object localization information or object class information or both. This reduced 30% annotation time on PASCAL-VOC dataset
  - Consequently, we were also able to create 3 active learning query metrics for detection with point supervision.
  - These two works were accepted at the BMVC'19 and BMC Plant Methods journal.

Other Applied Projects[†]

- **Deep Active Learning Toolkit in PyTorch** *Sept. 2020*
  - This is an end-to-end PyTorch toolkit with 8 popular deep active learning query methods implemented.
  - Code: https://github.com/acl21/deep-active-learning-pytorch

- **Image & Bounding Box Annotation Slicer** *Apr 2019*
  - Slices images and their bounding box annotations into smaller tiles as needed. It can also resize them, both by specific sizes and by a resizing/scaling factor.
  - Code: https://github.com/acl21/image_bbox_slicer

- **Mouse Cursor Control With Facial Movements** *Oct 2018*
  - Controls mouse cursor with facial movements, uses Deep Learning, works with a regular webcam. It is hands-free, no wearable hardware or sensors needed.
  - Code: https://github.com/acl21/Mouse_Cursor_Control_Handsfree
  - Demonstration video of the project received over 300,000 views and 7500 likes on LinkedIn.

[†]Full list of projects can be found on my GitHub account.

Relevant Skills & Certifications

- **Languages, Libraries & Packages**: Python, R, Java, C, C++, C#, SQL, PHP, JavaScript, PyTorch, TensorFlow.
- **Certifications**: Deep Learning (IIT Madras; AICTE-FDP approved), Computer Vision Nanodegree (Udacity), Deep Learning Specialization (Coursera), Java SE 6 Programmer (Oracle).

Positions of Responsibility

- Teaching Assistant to Dr. Vineeth N Balasubramanian for the courses: AI2100 & AI5100 - Deep Learning, CS5370 - Deep Learning for Vision, CS6360 - Advanced Topics in Machine Learning in 2020 & 2021, Summer School of AI in 2019 & 2021 (Project Mentor as well)
- Served as a subreviewer at NeurIPS'21, CVPPA'21, NeurIPS'20, ECCV'20, SIAM'20, IEEE TNNLS A/E, CVPPP'20 (reviewer also).
- Teaching Assistant to Dr. Vineeth N Balasubramanian & Project Mentor during the Summer School of AI in 2019 & 2021 held at IIT Hyderabad.
- Student Mentor, Project Reviewer & Peer-to-Peer Auditor at Udacity Inc. since November 2018.
- Volunteered to work as a machine learning instructor for 6 hands-on sessions at EduRidge India in 2018.
- Volunteered to teach Math and Physics at underprivileged high schools as part of Vidyanvahini (Knowledge on Wheels) initiative in 2014.

References

1. **Dr. Vineeth N Balasubramanian**, Head of Department - Department of Artificial Intelligence / Associate Professor - Department of Computer Science and Engineering, Indian Institute of Technology, Hyderabad - India.

2. **Neil Gogte**, Founder, Director and Professor at Keshav Memorial Institute of Technologies / Secretary, Founder at Neil Gogte Inistitute of Technologies, India.

3. **Manas Pant**, Associate Vice President, Data Science at PasarPolis Indonesia. Former Senior Manager at GGK Technologies, India.