Akshay Raj Dhamija

Computer Vision & Deep Learning Researcher

About Me

I am a computer science PhD student graduating in spring 2022. My research is focused towards deep learning for computer vision and I have a keen interest in application of everyday research to real world scenarios. My prior experience is spread across various problem domains such as face recognition, object recognition and detection, metric learning, scaling and optimizing pre-existing code. Apart from research I love designing user facing products and share an enthusiasm for managing painless project deliveries, if such a world exists :).

akshay-raj-dhamija
.github.io

git
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in
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Skills

Python	C++
PyTorch	Caffe2
Caffe	Keras
NumPy	Git
OpenCV	Java

Interests

Computer Vision
Deep Learning
Machine Learning

Experience

Computer Vision Intern (12/19 - 02/20) **Samsung Research America (Neon.life)**
Worked on end-to-end deep learning framework to bring digital avatars to life including semantic labeling, human pose estimation, feature representation and rendering, model training, optimization, deployment etc. Actively contributed to the showcasing of the final product at **CES2020**.

Computer Vision Intern (06/18 - 8/18) **Misty Robotics**
Developed **object detection** and **face detection** algorithm for **on the device** inferencing in android based systems.

Research Assistant (09/15 - Today) **Vision And Security Technology Lab**
Research aimed at open-set **image classification**, **object detections**, **face recognition** systems and their **evaluation**. Also worked on projects of **object detection in drone videos**, **dataset collection**, **annotation** and challenge organization.

Project Consultant (11/12 - 08/15) **My Personal Health Records eXpress (MphRx)**
In a dynamic healthcare startup I was responsible for **requirement gathering**, **product design**, **project planning**, **sprint planning**, **sprint reviews**, **daily scrums** and **product delivery** to release mobile and web based applications. Also got an opportunity to design, develop and deliver **user log analytics** using **SQL and NoSQL databases**.

Patent

Systems and methods for machine classification and learning that is robust to unknown inputs
Terrance E. Boult, **Akshay Raj Dhamija** and Manuel Günther
US Patent App. 16/442,469 - 2020

Publications

Complete list @

Reducing Network Agnostophobia
Akshay Raj Dhamija, Manuel Günther and Terrance E. Boult
Neural Information Processing Systems (NeurIPS) 2018 - Oral *(Acceptance rate 3%)*

The Overlooked Elephant of Object Detection: Open Set
Akshay R. Dhamija, Manuel Günther, Jonathan Ventura and Terrance E. Boult
Winter Conference on Applications of Computer Vision (WACV) 2020 (Acceptance rate 34.5%)

Improving Deep Network Robustness to Unknown Inputs with Objectosphere
Akshay Raj Dhamija, Manuel Günther and Terrance E. Boult
Uncertainty and Robustness in Deep Visual Learning
(CVPR'2019 workshop) - Oral *(Acceptance rate 22.5%)*

Towards a Unifying Framework for Formal Theories of Novelty
TE Boult, PA Grabowicz, DS Prijatelj, R Stern, L Holder, J Alspector, M Jafarzadeh, T Ahmad, **AR Dhamija**, C Li, S Cruz, A Shrivastava, C Vondrick, WJ Scheirer
AAAI Conference on Artificial Intelligence (AAAI 2021) *(Acceptance rate 21%)*

I-MOVE: Independent Moving Objects for Velocity Estimation
Jonathan Schwan, **Akshay R. Dhamija** and Terrance E. Boult
Winter Conference on Applications of Computer Vision (WACV) 2020 *(Acceptance rate 34.5%)*

Learning and the Unknown: Surveying Steps toward Open World Recognition
Terrance E. Boult, **Akshay Raj Dhamija**, Steve Cruz, Manuel Günther, James Henrydoss and Walter Scheirer
Proceedings of the AAAI Conference on Artificial Intelligence - 2019 *(Acceptance rate 16.5%)*

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Watchlist adaptation: protecting the innocent
Manuel Günther, **Akshay Raj Dhamija** and Terrance E. Boult
International Conference of the Biometrics Special Interest Group (BIOSIG) - 2020 *(Acceptance rate 32%)*

Unconstrained face detection & open-set face recognition challenge
M. Günther, P. Hu, C. Herrmann, C. H. Chan, M. Jiang, S. Yang, **A. R. Dhamija**, D. Ramanan, J. Beyerer, J. Kittler, M. Al Jazaery, M. I. Nouyed, G. Guo, C. Stankiewicz, and T. E. Boult
Challenge paper at International Joint Conference on Biometrics (IJCB) 2017
vast.uccs.edu/Opensetface/

Awards

Top Scholar Award - Mountain Lion Research Day
University of Colorado
Outstanding Masters Degree Student - Computer Science
University of Colorado
Graduate Research Award
University of Colorado
Student presenter for Foundation Board of Trustee's
University of Colorado

Education

2018 - Now **PhD Student (Expected 2022) - Computer Science**
University of Colorado, Colorado Springs

2015 - 2017 **Master of Science - Computer Science**
University of Colorado, Colorado Springs

2010 - 2012 **Master of Business Administration - Software Enterprise Management**
Guru Gobind Singh Indraprastha University, New Delhi

2006 - 2010 **Bachelor of Technology - Biomedical Engineering**
Rajasthan Technical University, Kota, Rajasthan

Other Projects

VR website using A-Frame
Aimed towards experiencing basics of Virtual Reality and creating a personal virtual reality website using A-Frame. The website may be found at akshay-raj-dhamija.github.io/vr

Android application for GRE aspirants
The project was aimed at learning Android Application development and creating an application for GRE aspirants for practicing Reading Comprehensions. More than 5000 Downloads and 900 active users. Play Store Link

Robot object fetching
The project was a part of the robotics course at UCCS, where a robot equipped with a camera and a raspberry pie was used to identify a predefined cylindrical object, approach it and grip. Four ultra-sonic sensors were also used in order to localize the robot. ROS was used in the above project.

Patient monitoring system
The project involved developing a patient monitoring system with parameters of temperature and ECG waveform fed into a PC where processing was done in MATLAB. This project couldn't be completed but a few Heart Rate Variability (HRV) parameters (Heart rate, RR Interval, NN50 and SDNN) were successfully extracted from a pre-stored ECG signal.

Implementing goods codification and production reporting system at FPSI
Proposing facility layout plans for an industry in MSME segment