Keerthy Kusumam

CONTACT INFORMATION

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EDUCATION

Ph.D. in Computer Science University of Nottingham, UK *(Oct 2017 - Sep 2021)*
Thesis: *Mood Analysis Across Domains using Deep Learning.*

MSc. by Research in Computing University of Lincoln, UK *(Dec 2013 - Jan 2015)*
Thesis: *Novel Computer Vision techniques for Food Quality Inspection.*

MSc. Advanced Computer Science University of Leeds, UK *(Sep 2011 - Sep 2012)*
Graduated with **Distinction**. Grade point average: **70.25**.
Thesis: *Computer Vision and Machine Learning for Human Activity Recognition.*
Project awarded with **Distinction.**

Key Modules

•Machine Learning	•Computer Vision	•Scheduling
•Computational Modelling	•Scientific Computation	•Algorithm Design

BSc. (Hons) Computer Science University of Kerala, India *(Aug 2006 - Jul 2009)*
Graduated with **Distinction**. Grade point average: **84.3**

SPECIALISATION

Computer Vision, Machine Learning, Image Processing, Pattern Recognition

RESEARCH EXPERIENCE

Research Intern, BlueSkeye AI, Nottingham, UK
Sep 2020 to Dec 2020

- Design and implementation of a social gaze estimation system using synthetic data and deep learning.
- Deployment of the trained and optimised models on Android.

Ph.D. Candidate, Horizon Centre for Doctoral Training, Computer Vision Laboratory, University of Nottingham
Oct 2017 to Present

- Developing novel algorithms for automated mood analysis on large scale data collected using a smartphone in natural settings.
- Design and implementation of deep learning algorithms applied to face alignment, human pose estimation, super-resolution, image generation and domain adaptation problems in torch and pytorch.
- Worked on unsupervised generative models for face manipulation and novel view synthesis of people, using Generative Adversarial Networks (GANs), which is currently accepted for publication at ICPR 2020.

Research Assistant, Computer Vision Laboratory, University of Nottingham
Sep 2016 to Sep 2017

- Software and game development for the project lazy-iBit to treat amblyopia in children using eye-gaze tracking.
- Deployment of facial landmarks tracker built in Matlab on to ios device.

Research Assistant, Lincoln Centre for Autonomous Systems, University of Lincoln

Robotic harvesting of broccoli using 3D vision
Jun 2015 to Aug 2016

- Developed a 3D vision system using low-cost RGB-D sensors to recognize and localize mature broccoli heads in the field.
- Evaluates different 3D features, machine learning and temporal filtering methods for detection and tracking of broccoli heads in 3D point clouds.
- Evaluates Kinect V2, Asus Xtion Pro and Ensenso cameras for imaging along with IMU and GPS sensors.
- Funded by BBSRC and Innovate UK.
- Delivered peer reviews for venues such as ICRA, IROS, ICCV, IJCAI.

Feb 2015 to May 2015

- Automatic recognition of food components and volume estimation from ready meals using 3D point clouds.
- Implementation using C/C++ libraries.

Novel Computer Vision Techniques for Food Quality Analysis
Dec 2013 - Jan 2015

- TSB funded project for automatic identification and measurement of pest damage for quality inspection of field beans.
- Implemented robust and accurate system for detecting and classifying damaged bean samples from digital images taken with a simple camera or handset.
- Uses state-of-the-art object recognition pipeline using vision and machine learning algorithms.
- System implemented using Matlab and C/C++ libraries.

Research Intern at the Vision Group,School of Computing, University of Leeds
Oct 2012 - Jan 2013

- Worked as a part of US defense research agency *DARPA* funded *'Minds Eye'* project under the supervision of Prof. Anthony G. Cohn.
- Activity analysis using qualitative spatial and temporal relations between human body parts.

Human Activity Recognition using graph-based relational learning approach
Feb 2011 - Aug 2011

- Human activity analysis by using pose estimation to model the interactions between body parts using qualitative spatio-temporal relationships in a relational learning framework.
- Applications in smart surveillance systems. Implemented using Matlab.

PUBLICATIONS

Keerthy Kusumam, Enrique Sanchez Lozano and Georgios Tzimiropoulos. Unsupervised Face Manipulation via Hallucination. Accepted for publication at *International Conference on Pattern Recognition (ICPR)*, 2020.

Keerthy Kusumam, Tomáš Krajník, Simon Pearson, Grzegorz Cielniak and Tom Duckett. Can you pick a broccoli? 3D vision based detection and localisation of broccoli heads

in the field. In *International Conference on Intelligent Robots and Systems (IROS)*, 2016

Keerthy Kusumam, Tomáš Krajník, Simon Pearson, Tom Duckett and Grzegorz Cielniak. 3D Vision based detection, localisation and sizing of broccoli heads in the field. In *Journal of Field Robotics*, 2017.

Tomáš Krajník, Pablo de Cristóforis, Matias Nitche, Keerthy Kusumam, and Tom Duckett. Image features and seasons revisited. In *European Conference on Mobile Robots (ECMR)*, 2015.

Awards

Best Paper Nominee at the ACM Intelligent Virtual Agent (IVA) conference 2019.
3D broccoli harvesting featured at the BBC and the Wired.
Poster and oral presentations at internal school events and industrial partner meetings.

Technical Skills

Dexterity in using computer tools for carrying out scientific research and presenting it.

C	C++	Python
Pytorch	Torch	Tensorflow
OpenCV	PCL	Matlab
Git	PlayMaker	Unity 3D
Visual Basic	J2EE	MySQL
Java	Oracle 8i	JavaScript

Teaching Experience

Lab demonstrations for 'Operating Systems' module at the School of Computer Science,University of Lincoln.

Module assistantship involving lab demonstrations and coursework grading for Masters Level Machine Learning module at the School of Computing, University of Leeds.

Work Experience & Projects

Associate Engineer *at Wipro Infotech (April 2010 August 2011)*

- Practical experience implementing VOIP architectures in NORTEL, CISCO and AVAYA technologies.
- Managed Java based remote desktop sharing tool, CA Support Bridge.

Referees

Provided upon request.