Sandeep Konam

CONTACT INFORMATION

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RESEARCH INTERESTS

Deep/Machine Learning, Natural Language Processing/Understanding, Computer Vision

EDUCATION

Carnegie Mellon University, School of Computer Science, Pittsburgh, PA
M.S. Robotics — *Graduated:* May 2017
Courses: CGPA: 3.84/4.33

11-785: Deep Learning	15-780: Graduate Artificial Intelligence
16-720: Computer Vision	16-824: Visual Learning and Recognition
10-701: Machine Learning	16-811: Math Fundamentals for Robotics
45-909: Designing and Leading a Business	16-741: Mechanics of Manipulation

Rajiv Gandhi University of Knowledge Technologies, R.K.Valley — *Graduated:* May 2015
B.Tech, Electronics and Communication Engineering (Major) — CGPA: 9.14/10.0
Computer Science and Engineering (Minor)

EXPERIENCE

Senior Product Manager — May 2017 - Present
UPMC Enterprises

Research Assistant — Nov 2015 - May 2017
CORAL Robot Lab — Advisors: Manuela M. Veloso, Stephanie Rosenthal
- Developed vision-based techniques to support robot mobile autonomy in human environments, including also providing reasoning behind a classification/decision-making

Computer Vision Intern — May 2015 - Aug 2015
Skycision Inc.
- Developed novel computer vision algorithms to provide key predictive analytics from drone collected crop-imagery.

Research Assistant — Aug 2015 - Oct 2015
Robust Adaptive Systems Lab, Field Robotics Center — Advisor: Nathan Michael
- Explored distributed, real-time cooperative localization and mapping between multiple robots operating throughout an unknown environment using indirect measurements.

M.S. THESIS

VISION-BASED NAVIGATION AND DEEP-LEARNING EXPLANATION FOR AUTONOMY — Nov 2015 - May 2017

Advisors: Manuela M. Veloso, Stephanie Rosenthal

Developed
- a visual navigation technique to establish CoBot - ARDrone collaboration to accomplish search tasks
- a deep-learning-based perception system for UAVs to avoid obstacles in real time
- an algorithm to explain the output of a CNN image classifier by automatically evaluating the neurons and their importance to the classification

UG THESIS

FACE DETECTION TO AID LOW VISION PATIENTS — Oct 2014 - May 2015

Supervisor: Dr. Eli Peli, Schepens Eye Research Institute, Harvard Medical School.
Internal Supervisor: Prof. R.V. Raja Kumar, Former Vice-Chancellor, RGUKT.
- Developed an application to augment and present enhanced scene understanding specifically related to face detection to aid low-vision patients.

PUBLICATIONS

Sandeep Konam, Stephanie Rosenthal, Manuela Veloso "UAV and Service Robot Coordination for Indoor Object Search Tasks." *Workshop on Autonomous Mobile Service Robots, International Joint Conference on Artificial Intelligence 2016.* [pdf]

Sandeep Konam, Nageswara Rao Narni "Statistical Analysis of Image Processing Techniques for Object Counting." *(IEEE Xplore) Proc. International Conference on Advances in Computing, Communications and Informatics (ICACCI-2014).*

Sandeep Konam"Agricultural Aid for Mango cutting (AAM)." *(IEEE Xplore) Proc. International Conference on Advances in Computing, Communications and Informatics (ICACCI-2014).*

Sandeep Konam, Naga Srinivasa Rao, Mohan Krishna Kamatam, "Design Encompassing Mechanical Aspects of ROTAAI (Robot To Aid Agricultural Industry)." *(IEEE Xplore) Proc. International Conference on Soft Computing & Machine Intelligence (ISCMI 2014)*, December 16-18, 2014.

Course Projects

PLAYING VIDEO GAMES WITH DEEP NETWORKS

Visual Learning and Recognition Spring 2016

- Implemented DeepMind's Deep Q Network, a convolutional neural network, trained with a variant of Q-learning, whose input is raw pixels and whose output is a value function estimating future-rewards.

DEEP LEARNING FOR SPEAKER RECOGNITION

Machine Learning Spring 2016

- Built a LSTM based speaker recognition system on a dataset collected from Cousera lectures. We achieved an accuracy of 93 % .

REAL-TIME PLACE MATCHING FOR LOOP CLOSURE IN A SLAM SYSTEM

Computer Vision Fall 2015

- Done as part of a larger Global Consistent Mapping for autonomous aerial vehicles effort. It includes implementation of a place recognition system, and a loop closing procedure for keyframe-based SLAM.

DATA ASSOCIATION FOR A DISTRIBUTED LOCALIZATION AND MAPPING SYSTEM

Math Fundamentals for Robotics Fall 2015

- Analyzed Expectation-Maximization (EM) approach to infer the robot initial relative poses and solve the multi-robot data association problem.

Research Projects

MOBILE - BASED BLOOD SAMPLE IMAGE ANALYSIS

Google Summer of Code 2015

Image Analysis, App Development May 2015 - Aug 2015

- Developed android application for a screening test for the detection of cancer bio-marker(s) from a small drop of blood.

GLAUCOMA DETECTION: PERFORMANCE ANALYSIS OF CDR VARIANTS AND CAR

Advisor: Prof. Jayanthi Sivaswamy, CVIT, IIIT-H.

Medical Image Analysis May 2014 - Jul 2014

- Analysed performance of four variants in Cup to disk Diameter Ratio (CDR) and Cup to disk Area Ratio (CAR) on the basis of feature classification accuracy.
- Qualitative and quantitative results of assessment of the adopted segmentation methods along with the discrepancies among CDR values have been analysed.

AGRICULTURAL AID FOR MANGO CUTTING (AAM)

Computer Vision, Embedded Systems, Design, Robotics Mar 2014 - May 2014

- Developed computer vision algorithms pertaining to mango localization and segmentation.

ROBOT TO AID AGRICULTURAL INDUSTRY (ROTAAI)

Robotics, Computer Vision, Embedded Systems Oct 2013 - Jan 2015

Machine vision based Unmanned Aerial Vehicle for Terrain analysis, Mango cutting and Animal Intrusion Avoidance.

- Developed computer vision algorithms related to motion de-blurring, video-mosaicing and image stitching.

Relevant Proficiencies

Programming Languages: C, C++, Python, Java
Software: ROS, OpenCV, MATLAB, Multisim
Hardware: Microcontrollers (Arduino/Atmega, MSP 430), Spartan 3E, Raspberry Pi
Operating Systems: Windows, Linux/Unix