Mohit Kumar Pandey

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Objective

Seeking summer internship opportunity at a vibrant firm to fully utilize my knowledge and skills in computer programming, artificial intelligence and computer vision and to employ them towards overall growth of company and build my professional career.

Education

Rutgers University, Department of Computer Science, New Brunswick, NJ — May 2017
Master of Science in Computer Science — **GPA - 3.83/4.0**
Coursework: Algorithms • Computer Animations and Game Design • Artificial Intelligence
Computer Vision • Machine Learning

Shri G.S. Institute of Technology and Science, Indore, India — May 2015
Bachelor of Engineering in Electronics and Telecommunication — **GPA - 7.26/10**

Academic Projects

Fast Trajectory Replanning– MATLAB, Artificial Intelligence ***[https://goo.gl/aGZFrs]***

- Implemented path finding algorithm A-Star and its variants like Adaptive A-Star, Repeated Forward A-Star, Repeated Backward A-Star, weighted A-Star with Manhattan and Euclidean Heuristics.
- Implemented and analyzed results of different possibilities of tie breaking for 'g values' and weighting factor. *[https://goo.gl/WpaGKF]*

Classification and Optical Character Recognition– Machine Learning, Computer Vision ***[https://goo.gl/BDmtXc]***

- Extracted various morphological features from hand written character images and then used k-nearest neighbors to classify images of digits and characters. Received an average accuracy of over 90%.
- Spam Detection: Implemented Naive Bayes Classifier using Dirichlet and Gaussian priors to classify an e-mail as 'spam' or 'not-spam'. Also implemented perceptron classifier and kernelized variant using Gaussian Kernel for same problem.

Computational Photography– Computer Vision

- Texture Synthesis- Developed a larger 200x200 image from a given texture 65x65 texture pattern. Implemented Texture Synthesis Non-Parametric Sampling.
- Image Inpainting and object removal: Used texture synthesis to fill in missing areas in a given image. Also, seamlessly remove user defined areas in image.

Game Development- Unity, C# ***[https://goo.gl/vhT0qC]***

- Developed a fun timer based single and multiplayer ball game with shared screen capability and involving object collection.
- Created a navigation system involving choosable multi agents environment. Used Unity's Navigation meshes for agents and obstacles. Made animated humanoids using Mecanim Animation System.
- Authored various behaviors for humanoid agents using a behavior tree implementation in Unity. Integrated and used KADAPT library to develop the behavior tree and created control node of own. Used Inverse Kinematic library Final IK to developed Interactive Narration.

Crowd Optimization and Simulation- SteerLite, C++ ***[https://goo.gl/5vh0V2]***

- Implemented Hermite and Catmull Rom Splines for multi agent environment. Animated camera and agents using these curves.
  - [https://goo.gl/k6hP8E]
- Detected collisions for convex and concave polygonal obstacles by implementing GJK Algorithm and reported penetration depth and penetration vector using EPA Algorithm.
  - [https://goo.gl/vOB53h]
- Implemented Social Forces Algorithm for goal-directed collision avoidance for single agent environments and complex crowds.
  - [https://goo.gl/1KoPSo]
- Created crowd optimization solutions for various complex scenarios and also designed crowd animation for these scenarios from the scratch.
  - [https://goo.gl/jO76YV]

Low Cost Gesture Based Mouse – OpenCV, Java, Computer Vision ***[https://youtu.be/b8oM2PyUtjI]***

- Developed Java Desktop Application to access mouse based on user's gesture. The Application does not expect the user to wear additional hardware in order to detect fingers. The application detects 9 static gestures including opened and closed palm, claw, OK and O signs, Gun Sign, Pinch, Pointing and Finger Tap and supports common mouse actions like Pinch to Zoom, Scroll, Swipe, Wave, Finger push to click.
- Designed a robust algorithm for thumb detection for complex hand positions at runtime.

Vehicle Registration Plate Recognition System– MATLAB, Image Processing

- Designed an effective algorithm to automatically localize registration plates from images of Indian Vehicles based on their morphological

characteristics.

- Used Fuzzy Sets for Spatial Filtering, Implemented line and edge detection for image segmentation, Radon Transform for image reconstruction, Connected Components and Area Based Registration for image recognition.

Recommendation Review System– Java, JavaScript, Data Analysis

- Reverse engineered a recommendation system and developed a web application to check the degree of connectedness among the output results of recommendation system. The resulting graph was created and displayed.
- The most strongly connected component to user's past history was also shown to the user.

Academic Achievements and Papers

- Paper on Automatic Vehicle Registration Plate Recognition System using Soft Computing Techniques published in International Journal Computer and Electronics Research (Vol.3, Issue 5) [http://goo.gl/y664XQ]
- Presented paper on Iris Recognition for ATM security at SGSITS, Indore, 2013.
- Presented paper on Low cost gesture based mouse for intuitive computer operation at SGSITS, Indore, 2013.
- Presented paper on Environmental Planning at the 4th Inter School Paper Presentation Competition organized by The Environmental Planning & Co-ordination Organization (EPCO).
- Secured First position among 60 colleges in State level technical poster presentation competition organized by Vijana Bharati, 2012.
- Secured All India Rank 1887 in National Aptitude Test by NIIT, India, 2013 (Top 1 percentile.)
- Awarded Distinction in Australian National Chemistry Quiz by Royal Australian Chemical Institute in 2008.
- Secured All India Rank 9411 in Indian Institute of Technology -JEE 2011 among 530,000 students.