

Satish Palaniappan

Curriculum Vitae

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Interests

Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Algorithm Design, Reinforcement Learning.

Educational Background

- 2012-2016 **Sri Sivasubramaniya Nadar College of Engineering (SSN CE), Anna University,**
B.E. Computer Science and Engineering, CGPA: 8.56/10.
- 2010-2012 **TVS Matriculation Higher Secondary School (TVS M HSS),**
12th Grade (Higher Secondary Certificate), Score: 98%.

Academic Research Experience

- Dec, 2015 - **Research Assistant, INSTITUTE OF MATHEMATICAL SCIENCES, CHENNAI.**
Present **Optical Character Recognition on Indus Scripts** [link] [paper]
under Prof. Ronojoy Adhikari, Department of Physics
- Recognize Indus script symbols from scans and photographs of ancient Harappan civilization artifacts.
 - Techniques:** Convolutional Neural Networks (CNN), GoogLeNet, Transfer Learning, and Selective Search.
 - Media Coverage:** *The Hindu*, *The Verge* (small piece), *Times of India*, and *SBS Radio - Australia*.
- Dec, 2014 **Research Intern, CARNEGIE MELLON UNIVERSITY (IPTSE WINTER SCHOOL).**
Text Based Emotion Recognition System [link]
under Prof. Bhiksha Raj and Prof. Rita Singh, Department of Computer Science
- Classify any textual data, using histograms built based on word2vec word/phrase clusters, into one of the 7 chosen basic emotions.
 - Techniques:** Word2Vec, Latent Dirichlet Allocation (LDA), K-means, Support Vector Machines (SVM), Probabilistic N-Gram models, Multinomial Naive Bayes.

Industry Research Experience

- Jun, 2016 - **Software Engineer, QUBE CINEMA TECHNOLOGIES, INDIA.**
Present under Rajesh Ramachandran, Chief Technology Officer & President
- Projects:**
 - Scalable **viewer-demographics mining engine**, that can extract information such as count, age, gender, and emotions of the movie watchers, from low-light images of a theatre's auditorium.
 - Real-time, adaptive, **resource allocation and optimization algorithm**, for making business decisions intelligently and maximizing profits.
 - Smart-bot for automatically syncing theatre databases** across the globe, into one unified format.
 - Techniques and Tools:** CNNs with feedback-based learning, Semantic similarity models built over digital-cinema domain data, Camera Calibration, Amazon Web Services, Flask+uWSGI+Nginx servers.
 - Algorithms:** Knapsack Problem, Minimum Cost Flow (Transportation) Problem, Pruned Search Trees, Recursive and Linked Interval Trees.
- May, 2015 - **Data Scientist - Intern, SERENDIO INC., INDIA.**
Jul, 2015 under Ravi Condamoor, Chief Executive Officer
- Projects:**
 - Universal multi-domain **sentiment scorer** for text [link].
 - Topic composition modeling** using hierarchical K-Means and semantic word clusters [link].
 - Internet slang text parser** [link].
 - Techniques and Tools:** Gensim, Tf-idf features, Bagging and Boosting, CMU ARK's Twokenize, Rake - Keyword Extractor, Web Crawlers, etc.
 - Serendio Inc.'s **campus ambassador** at SSN CE.

Research Papers, Patents and Theses

- Feb,2017 Paper titled, "**Deep Learning the Indus Script**", PLoS ONE (submitted), arXiv:1702.00523v1.
- Apr,2016 Undergraduate thesis titled, "**Automated Scenario Description for Images**", Anna University. [\[link\]](#)
- Apr,2015 Paper titled, "**Home Automation Systems - A Study**", International Journal of Computer Applications (IJCA), Vol. 116 - No.11, Reference ID: pxc3902601. [\[link\]](#)
- **Best paper award**, SSN UG paper presentation event. 13 Citations [\[google scholar\]](#).
- Oct,2015 Patent filed, titled, "**Universally Compatible and Accessible, Software Controlled, Expandable Home Automation System, for Energy Conservation and the Differently-Abled**", Reference ID: 5729/CHE/2015. [\[video report\]](#), [\[patent search link\]](#).
- Apr,2015 Paper titled, "**Automated Meter Reading System - A Study**", International Journal of Computer Applications (IJCA), Vol. 116 - No.18, Reference ID: pxc3902783. [\[link\]](#)
- Dec,2014 Poster presented, titled, "**Text Based Emotion Recognition System**", CMU-IPTSE Winter School, at NITK Surathkal. [\[link\]](#)

Projects

- Jun,2015 - **Automated Scenario Description for Images**, *Undergraduate thesis*, ANNA UNIVERSITY.
Apr,2016 under Prof. Milton R.S., Department of Computer Science and Engg., SSN CE, [\[link\]](#), [\[thesis\]](#).
 - Harnessed object identification and scene classification techniques to automatically generate natural language descriptions of images.
- Sep,2014 - **Software Controlled Appliances for Energy Conservation and Differently Abled people**,
Jun,2015 *Funded research project*, SSN INNOVATION CENTER, [\[link\]](#).
 - Built a Raspberry Pi powered, adaptive and modular system, to provide planet-wide access to electronic appliances using software interfaces (mobile apps) via the Internet cloud. (Internet of Things)
- Mar,2015 **Intelligent Food Resources Monitoring & Management system (PingMyFood - The Food Network)**, *Startup venture*, SSN ENTREPRENEURSHIP DEVELOPMENT CELL, [\[link\]](#).
 - Built a social network for food sharing. It collaboratively mitigates food resource wastage by routing the surplus food to food deficit regions and also allows everyone to share food with each other.
 - Powered by an intelligent, cuisine, food, and chef based topic modeling and quality rating system.
- Feb,2015 - **Automated Scoring of YouTube videos from Pairwise Comparisons and Metadata based on**
Dec,2015 **Degree of Funniness**, *Side project*, [\[link\]](#).
 - Built a regression model, that scores YouTube videos based on their degree of funniness with just the non-video metadata such as the title, description, and comments.
 - Developed a heuristic for converting the pairwise comparisons into unified overall rankings across videos.
- Sep,2015 **Market Segmentation based on Customer Activity**, *Business Analytics Hackathon*, SSN SCHOOL OF ADVANCED CAREER EDUCATION, [\[link\]](#).
 - Developed a market segmentation algorithm by clustering human activity patterns tracked and predicted using smartphone data such as accelerometer & gyroscope readings.
- Dec,2013 **Regional Transport Office (RTO) Management System**, *Software Development Engineer - Internship*, RAMCO SYSTEMS, INDIA, [\[link\]](#).
 - Worked on building and managing fail-safe redundant database systems.
 - Learned about Enterprise Resource Management (ERP) on cloud.

Awards and Achievements

- **Merit Scholarship (Full)** for Excellence in Academics, 1st Year, worth Rs.105,000, SSN CE.
- **Microsoft Research** certified, for proficiency in "Design and Analysis of Algorithms".
- **Top 4** in the state and **Top 100** across the country, **Aspirations 2020** programming contest, **Infosys**.
- **Industry Mentor** at the **Smart India Hackathon** (world's largest hackathon), organized by the **Government of India**. (My team also won the 2nd **Runners-up** position (Department of Posts)).
- **Outstanding Student Organizer Award**, SSN ACM Student Chapter.

- **Young Achiever Award** for Excellence in Academics, Tractor And Farm Equipment Ltd., India.
- All India Rank of 456 in the 14th **National Science Olympiad**.
- Rated as an **excellent programmer in "C"** by NIIT.

Talks

- **Deep learning based OCR engine for the Indus script.**
 - o **Venues:** Indian Deep Learning Initiative (IDLI) [\[slide deck\]](#) [\[video\]](#) [\[link\]](#), ThoughtWorks Geek Night [\[slide deck\]](#) [\[video\]](#) [\[link\]](#), ChennaiPy [\[link\]](#), Anthill Inside 2017 [\[proposal\]](#).
- **Pokemon World and The Indus Valley Civilisation - The Analogy.**
 - o **Venues:** Faculty Development Program, AICTE - SSN CE [\[slide deck\]](#), Qube Cinema Technologies - Offsite 2017 [slide deck](#) [\[V1, V2\]](#)
- **ML from a CV and NLP perspective**, at Qube Cinema Technologies - Offsite 2016 [\[slide deck\]](#).
- **Python Hands-on**, Two-day workshop, at ACM Student Chapter, SSN CE [\[link\]](#).

Open Source Contributions

- Diskoveror** **Text analytics package.**
- o Developed the Topic Modeling and Sentiment Analysis modules in Python. [\[link\]](#)
 - o Interfaced the Python and existing Java code bases via Facebook's Thrift API. [\[link\]](#)
- RealImage** **Algorithm for territorial restriction of film distribution rights**, Challenge 2016.
- o Implemented using hash maps, trees, and bit indexes with constant time lookup. [\[link\]](#)
- Keras** **Deep Learning library for Python.**
- o Implemented random shear data augmentation technique as a part of the CNN's training pipeline. [\[link\]](#)
- Gensim** **Topic modeling library for Python.**
- o Ported the phrase vector representation technique of word2vec word vectors, from C to Python. [\[link\]](#)

Technical Skills

- Languages Python, Java, C, C++, VB.Net, R
- Libraries CAFFE, TENSORFLOW, KERAS, OPENCV, Scikit-Learn, NLTK
- Others Linux, Android SDK, Git, \LaTeX , Docker, Adobe Photoshop

Professional Affiliations

- 2014 - 2016 **Association for Computing Machinery (ACM)**, Student Chapter, SSN CE.
- o Roles: **Chairman** (2015 to 2016), **Treasurer and Tech Lead** (2014 to 2015)
- 2014 - 2015 **Google Student Club (GSC)**, Tech Lead, SSN CE.
- 2015 - 2016 **Indian Society for Technical Education (ISTE)**, Vice President, Student Chapter, SSN CE.
- 2015 - 2016 **Placement Cell**, Student Placement Coordinator, Computer Science Department, SSN CE.

Standardized Tests

- GRE** Score: **324** / 340
- **Quantitative:** 169/170, **Verbal:** 155/170.
- TOEFL** Score: **116** / 120
- **Reading:** 29/30, **Listening:** 30/30, **Speaking:** 28/30, **Writing:** 29/30.

Massive Open Online Courses

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|-----------------|-------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|
| Stanford | Machine Learning
Prof. Andrew Ng
Coursera | Natural Language Processing
Prof. Daniel Jurafsky
Coursera | CNN for Visual Recognition
Dr. Andrej Karpathy
CS231n |
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