

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, INDIA.**
Present **Optical Character Recognition on Indus Scripts** [\[link\]](#)
under Prof. Ronojoy Adhikari, Department of Physics
- To recognize Indus script symbols from scans and photographs of ancient Harappan civilization artifacts.
 - Techniques: Convolutional Neural Networks (CNN), GoogLeNet, Selective Search, and Transfer Learning.
 - This work got featured in [The Hindu](#), [The Verge](#) (small piece), [Times of India](#), and [SBS Radio - Australia](#).
- Dec,2014 **Research Intern, IPTSE Winter School, CARNEGIE MELLON UNIVERSITY, at NIT Surathkal.**
Text Based Emotion Recognition System [\[link\]](#)
under Prof. Bhiksha Raj, Department of Computer Science
- Classify any textual data, using histograms of word2vec word/phrase clusters, into the 7 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, CHENNAI, INDIA.**
Present
- Projects:
 - Scalable, **deep-learned, viewer-demographics mining** (count, age, gender, and emotions of the movie watchers), from low-light images of a theatre's auditorium.
 - Real-time, adaptive, partner **selection algorithm** for businesses.
 - **Intelligent bot for syncing theatre databases** around the globe into a unified format.
 - **Video super resolution** of a movie-clipping by up to four times, with minimal loss in clarity.
 - Techniques and Tools: CNN with master-child model and human-feedback-based learning, Knapsack Problem, Minimum Cost Flow Problem (Transportation Problem), Pruned Search Trees, Linked and Recursive Interval Trees, Generative Adversarial Networks (GAN), Camera Calibration, Amazon Web Services, and Flask+uWSGI+Nginx servers.
- May,2015 - **Data Scientist - Intern, SERENDIO INC., CHENNAI, INDIA.**
Jul,2015
- 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.
 - **Open Source Community Manager - Intern**, at Serendio Labs, the open source division of Serendio Inc.
 - Serendio Inc.'s **campus ambassador** at SSN CE.

Projects

- Jun,2015 - **Automated Scenario Description for Images**, *Undergraduate thesis*, ANNA UNIVERSITY.
- Apr,2016 under Prof. Milton R.S., Department of Computer Science, SSN CE, [\[link\]](#).
 - Harnessed object identification and scene classification techniques to automatically generate natural language descriptions of images.
- Feb,2015 - **Automated Scoring of YouTube videos from Pairwise Comparisons and Metadata based on Degree of Funniness**, *Side project*, [\[link\]](#).
 - Developed a ranking heuristic based on incomplete pairwise user preferences, using numeric video metadata.
 - Built a model using Support Vector Regressor and word vector representations to score videos based on textual metadata.
- Mar,2015 **Intelligent Food Resources Monitoring & Management system (PingMyFood - The Food Network)**, *Startup venture*, SSN ENTREPRENEURSHIP DEVELOPMENT CELL, [\[link\]](#).
 - Built a social network for sharing food, that collaboratively mitigates food resource wastage by routing the surplus food to food deficit regions and also allows anyone to share food with each other.
 - Coupled with an intelligent, cuisine and chef based, topic modeling and quality rating system.
- 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 system to provide planet-wide access to electronic appliances using software interfaces (mobile apps) via the internet cloud (Internet of Things).
- Sep,2015 **Market Segmentation based on Local Customer Activity**, *Business Analytics Hackathon*, SSN SCHOOL OF ADVANCED CAREER EDUCATION, [\[link\]](#).
 - Developed a market segmentation algorithm by clustering human activity patterns tracked using smartphone data such as the 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.

Research Papers and Patents

- Feb,2017 Research paper titled "**Deep Learning the Indus Script**", arXiv:1702.00523v1 preprint. [\[link\]](#)
- 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** at the SSN UG paper presentation event and has 12 citations [\[Google Scholar\]](#).
- Oct,2015 Patent filed under the title "**Universally Compatible and Accessible, Software Controlled, Expandable Home Automation System, for Energy Conservation and the Differently-Abled**", Reference ID: 5729/CHE/2015. [\[patent search link\]](#)
- 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 NIT Surathkal. [\[link\]](#)

Talks

- **Deep learning based OCR engine for the Indus script.**
 - 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 Indus Valley Civilisation - The Analogy**, at 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.**

- Developed the Topic modeling and Sentiment Analysis modules in Python. [\[link\]](#)
- Interfaced Python and Java code bases with Facebook's Thrift API. [\[link\]](#)

RealImage **Algorithm for territorial restriction of film distribution rights, Challenge 2016.**

- Implemented using hash maps, trees and bit indexes with O(1) lookup time complexity. [\[link\]](#)

Keras **Deep Learning library for Python.**

- Implemented random shear image data augmentation to manipulate data while training CNNs. [\[link\]](#)

Gensim **Topic modeling library for Python.**

- Ported the phrase vector representation technique of word2vec word vectors, from C to Python. [\[link\]](#)

Awards and Achievements

- **Mentored and advised a tech startup** that digitizes hardware inventory management in post offices and makes it more intelligent, we were the 2nd **Runners-up** in **Smart India Hackathon** (Dept. of Posts), organized and **incubated by the Government of India**.
- **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**.
- **Merit Scholarship** for the 1st academic year, worth Rs.105,000, SSN CE.
- **Young Achiever Award** for Excellence in Academics, Tractor And Farm Equipment Ltd., India.
- **Outstanding Student Organizer Award**, SSN ACM Student Chapter.
- All India Rank 456 in 14th **National Science Olympiad**.
- Rated as an **excellent programmer in "C"** by NIIT.

Technical Skills

Languages Python, C, C++, Java, R, VB.Net

Libraries CAFFE, TENSORFLOW, KERAS, OPENCV, Scikit-Learn, NLTK

Others Linux, Android SDK, Git, L^AT_EX, Docker, Adobe Photoshop

Professional Activities

2014 - 2016 **Association for Computing Machinery (ACM)**, *Student Chapter*, SSN CE.

- Roles: **Chairman** (2015 to 2016), **Treasurer and Tech Lead** (2014 to 2015)

2015 - 2016 **Indian Society for Technical Education (ISTE)**, *Vice President, Student Chapter*, SSN CE.

2014 - 2015 **Google Student Club (GSC)**, *Tech Lead*, SSN CE.

2015 - 2016 **Placement Cell**, *Student Placement Coordinator, Computer Science Department*, SSN CE.

Massive Open Online Courses

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