Satish Palaniappan

Curriculum Vitae

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Interests

Deep Learning, Computer Vision, Natural Language Processing, Algorithm Design, Machine Learning, 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 - Present **Research Assistant**, INSTITUTE OF MATHEMATICAL SCIENCES, CHENNAI, INDIA.
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*, *Times of India*, *The Verge* (small piece), 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 - Artificial Neural Networks (ANN), Latent Dirichlet Allocation (LDA), K-means, Support Vector Machines (SVM), Probabilistic N-Gram models, Multinomial Naive Bayes.

Industry Research Experience

Jun,2016 - Present **Associate Software Engineer**, QUBE CINEMA TECHNOLOGIES, CHENNAI, INDIA.
○ Projects:
  - Real-time adaptive partner **selection algorithm** for businesses.
  - Scalable **deep learning based computer vision algorithm** for mining the viewer demographics such as count, age, gender and emotions from periodic snaps of the theater auditorium.
  - **Intelligent bot for syncing theatre databases** around the globe into a unified format.
  - **Video super resolution** of an entire movie 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, Pruned Search Trees, Linked and Recursive Interval Trees, Generative Adversarial Networks (GAN), Camera Calibration, Amazon Web Services, and Flask+uWSGI+Nginx servers.

May,2015 - Jul,2015 **Data Scientist - Intern**, SERENDIO INC., CHENNAI, INDIA.
○ 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: Tf-idf features, bagging and boosting, Gensim, CMU ARK's Twokenize, Rake - Keyword extractor, RESTful APIs, Web crawlers.
○ Open Source Community Manager - Intern, at Serendio Labs, the open source division of Serendio Inc.
○ Serendio's campus ambassador at SSN CE.

Projects

Jun,2015 - Apr,2016   **Automated Scenario Description for Images**, *Undergraduate thesis*, ANNA UNIVERSITY. 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 - Dec,2015   **Automated Scoring of YouTube videos from Pairwise Comparisons and Metadata based on Degree of Funniness**, *Side project*, [link].
- Developed an overall ranking heuristic for incomplete pairwise preferences using numeric video metadata.
- Built an algorithm 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 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 intelligent cuisine and chef based topic modeling and quality rating systems.

Sep,2014 - Jun,2015   **Software Controlled Appliances for Energy Conservation and Differently Abled people**, *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 11 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]

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

- Certified for Proficiency in "Design and Analysis of Algorithms" by **Microsoft Research**.

- Mentored and advised a tech startup that **makes Hardware Inventory Management digital and intelligent**, who were the 2nd **Runners-up** in **Smart India Hackathon** (Dept. of Posts), organized and incubated by the **Govt. of India**.

- **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.

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]

- 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]*.

Technical Skills

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

Professional Activities

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

Extracurricular Activities

- **Organizing head** of "Open Programming", on-site competitive programming event in "Paradigm" (National level technical symposium, SSN CE).

- Designed and developed the initial website for SSN ACM Student Chapter (currently archived).

- Member of "**Teach A School**", an initiative to provide better education for the underprivileged.[link]

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