Sudharshan Chakravarthy

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Education

University of California - San Diego   *San Diego, USA*

Masters in Computer Science   *Winter 2020 - incoming*

- Coursework planned: Algorithm Design and Analysis, Advanced Compiler Design, AI: Learning Algorithms

SASTRA University   *Thanjavur, India*

B.Tech in Computer Science & Engineering | First Class with Distinction   *Jun 2013 - May 2017*

- Coursework: Cryptography & Network Security, Artificial Intelligence, Computer Networks, Data Structures, Data Mining
- CGPA : **8.96** / 10.0

Work Experience

TCS Innovation Labs   *Chennai, India*

Developer / Reseacher   *Jul 2017 - Present*

- Aiming to improve the safety parameters of Autonomous vehicles by rare-event detection and sampling
- Performed basic Automation Testing on NVIDIA DGX station using Selenium
- Developed software to enable dynamic allocation of GitLab jobs in an NVIDIA DGX station
- Optimized overall building energy consumption by 5% by optimizing the HVAC (Heating, Ventilation, and Air Conditioning) systems
- Programmed an IFTTT based web tool for automated building energy management and control

AI4Bharat.org   *Chennai, India*

Machine Learning Engineer   *Aug 2019 - Sep 2019*

- AI4Bharat.org is an open-source initiative aimed to solve India's socio-economic problems through AI
- Implemented EAST scene text detector for Indian signboard translation using PyTorch
- Implemented techniques to preprocess large datasets and tweaked the architecture to suit Indian language datasets
- Helped set up the project infrastructure in Google Cloud Platform

DRDL   *Hyderabad, India*

Software Engineer Intern   *Jun 2016 - Jul 2016*

- Used Fortran 77 (Legacy) and C++ to predict point object projectile trajectory given fixed initial parameters and stochastic weather constraints
- Learned techniques to model physics-based differential equations programmatically

IIIT-DM   *Kancheepuram, India*

Image Processing Lab Intern   *May 2015 - Jul 2015*

- Implemented an algorithm to perform robust watermarking of images in the frequency domain using MATLAB
- Used the meta-heuristic Antlion Optimizer to optimize the scaling factor of the watermarking process
- Introduced to applied research techniques while working with doctoral scholars
- Enhanced image security through evolutionary meta-heuristics

Publications

An optimized hierarchical encryption technique for tamper recognition

Springer - Multimedia Tools and Applications (Bachelor's thesis, Primary author)

- Developed an end-end image tamper recognition system
- Integrated this semi-fragile watermarking scheme with the evolutionary meta-heuristic SCA (Sine-Cosine Algorithm)
- Generated watermarked data with 16 standard attacks on images
- Trained a neural net with a softmax classifier is used recognize the type of attack on the watermarked image

Stego Pi: An automated security module for text and image steganography using Raspberry Pi

IEEE Xplore Digital Library

- Built the pre-processing step with a prime bit-XOR encryption and a recursive diagonal transformation
- Used a novel variant of Least Significant Bit steganography to embed the input in host image
- Modeled a spatial domain technique for texts and a frequency domain for images
- Automated the entire process using a Raspberry Pi 3B

Enhanced Playfair Cipher for Image Encryption using Integer Wavelet Transform

INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY (PRIMARY AUTHOR)

- Devised four mechanisms for Image Encryption using Integer Wavelet Transformation and Playfair cipher.
- Used a modified version of Playfair cipher for image encryption to prevent data loss
- Rectified lossy wavelets by implementing the second generation wavelet transform called Haar Lifting scheme

Art of misdirection using AES, bi-layer steganography and novel King-Knight's tour algorithm

SPRINGER - ADVANCES IN SIGNAL PROCESSING AND INTELLIGENT RECOGNITION SYSTEMS (PRIMARY AUTHOR)

- Brought together the paths of steganography and Rijndael encryption, which is commonly known as the AES.
- Built an automatic input detection module - image or text - in MATLAB
- Developed chaotic maps based on chess moves to increase data diffusion
- Formally learned research writing skills, and improved on articulation of ideas

Skills

Programming	Python, C, C++, MATLAB
Libraries	OpenCV, TensorFlow, Pandas, Scikit-Learn, Matplotlib, Seaborn, Selenium, PyTorch, Grequests
Web Technologies	HTML, CSS, Javascript, Django, Git, Bootstrap, PostgreSQL
Software Development	Agile - Scrum

Certifications

2020	**Deep Learning Specialization**, By DeepLearning.ai and Coursera
2019	**Writing for Research**, By Elsevier Researcher Academy
2017	**Machine Learning**, By Stanford University and Coursera - Audit
2017	**Buddhism and Modern Psychology**, By Princeton University - Coursera

Honors

2018	**Winner**, GoGamerPro TCS Ideathon
2017	**Dean's list Scholarship**, Top 10%, total: 3000
2016	**Dean's list Scholarship**, Top 10%, total: 3000
2015	**Dean's list Scholarship**, Top 2%, total: 3000
2014	**Dean's list Scholarship**, Top 2%, total: 3000
2013	**Topper**, Top 0.5% in All India Senior Secondary Certificate Examination (AISSC)

Volunteering

Purpose4Life
Chennai

SOCIAL SERVICE VOLUNTEER
May 2017 - Present

Over 50 hrs of service in the environment and education track.

Activities undertaken : Reading Scribe for visually challenged students, Beach clean-up drives, Tree sapling plantation drives, Nature walks, and Donation of clothes to orphanages.

DKMS-BMST
Chennai

DONOR
Aug 2019 - Present

A registered stem-cell donor to aid patients with blood cancer and Aplastic Anemia.

Association of Computer Engineers (ACE)
Thanjavur

EXECUTIVE MEMBER
May 2015 - May 2016

SASTRA University's official student body in School of Computing.

Activities : Organized programming hackathons and tech-talks periodically

Recreations

Activities	Chess , Travelling , Soccer , Yoga , Philosophy , Psychology