VOLUME: 7
ISSUE: 2

SMRITI

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SNEAK PEEK

HOD'S DESK

My heartfelt new year wishes to all of you. The activity has been frantic during the past three months. The new annex block has been made ready for occupation. The labs in the library block upstairs have been shifted to the new annex and are being used in the current semester. I thank all the lab in-charges and lab assistants for making this transition a smooth one to the extent possible.

All along, in the new upcoming Shiv Nadar University(SNU), Chennai, the plan was to have only programs in Mathematics, Commerce and Economics. The inclusion of 3 engineering programs(CSE, ECE and Mechanical) in SNU, Chennai transpired somewhere in the middle of December and that spearheaded sending a seven member delegation to Singapore Universities to learn their best practices. I have shared my observations in this edition.

I congratulate Bharathi for getting her DST SERB Teachers Associateship for Research Excellence (TARE) proposal approved and wish her the best in making good use of this collaboration opportunity with IIT Madras. I also congratulate Thenmozhi for getting a DST EEQ project approval.

I appreciate Lekshmi for successfully defending her thesis. I also congratulate Mirunalini for getting the approval from Anna University to guide Ph.D scholars.

I appreciate the widespread participation in solving the Machine Learning and Data Analytic tasks by our faculty members in Forum for Information Retrieval Evaluation(FIRE) at DAIICT, Gandhi Nagar and securing top ranks.

It has been very encouraging to see undergraduate students presenting their work in reputed international conferences abroad. I appreciate Sharath, Soundarya, Kowshik, Aarif, Bhaskar and Harish for the same. We are very proud to see Akash acing the CAT exam and coming out with flying colors. Congratulations Akash and best wishes from all of us for your dreams to come true.

Dr. Chitra Babu
HoD/CSE

FACULTY ACTIVITIES

1. PI **Dr. R. Kanchana** conducted the written test and interview for the recruitment of research fellows for the BIRAC funded research project on 16 Nov, 2018. Dr. Manjula, Head, Dept of CSE, CEG, AU was the external expert member of the interview panel.
2. The written test and interview were conducted for the recruitment of research fellows for the BIRAC funded collaborative research project at IIIT, Una on 30 November 2018, by its PI **Dr. R. Kanchana** along with Dr. S. Selvakumar, PI and Director, IIIT, Una.
3. **Dr. D. Venkata vara Prasad** attended a DC meeting at VIT University, Chennai on 26 Nov, 2018.
4. **Dr.A.Chamundeswari** organized DC confirmation meeting to Ph.D Research scholar, Kapilan K A G. He presented his Ph.D research problem to his external examiners, Dr.K S Easwarakumar, CEG, Anna University and Dr. Justus, VIT Chennai.
5. **Dr. T T Mirnalinee** attended the synopsis Meeting of Mr. M.S. MuraliDhar at PSG Tech Coimbatore on 9 Nov 2018.
6. **Dr. T. T. Mirnalinee** attended the confirmation DC meeting of Ms. Rani at SRM University on 29 November 2018.
7. **Dr. G. Raghuraman** conducted Confirmation DC Meeting for his Part-time scholar Ms. Indira Priyadharsini on 26.12.2018 10:00 A.M.
8. **Dr. Suresh J** conducted the confirmation meeting for Ph.D Scholar Ms. Lakshmi Priya S at Department of CSE, SSNCE on Dec 29, 2018.
9. **Dr Suresh J** attended the DC meeting for the Research scholars Ms. S.Lavanya, Ms. Sivasankari, Ms. Aswathy Cherian at 6th Floor, Tech Park, Departmental Library, SRM University.
10. **Dr. Suresh J** attended the Doctoral Committee meeting for Ph.D Scholar Ms.Madhana Department of CSE, PSG College of Technology, Coimbatore 25 Jan 2019.
11. **Dr. Chitra Babu** was part of the seven member delegation that visited National University of Singapore(NUS), Nanyang Technological University and University of Newcastle UK (Singapore Campus).
12. **Dr. Chitra Babu** along with **Mr. V. Balasubramanian** has prepared the department budget, research budget, cisco budget, consumables, furniture budget.

TALKS DELIVERED

Our department faculty members delivered talks with hands-on in the Five days short term training programme on "Transition from Machine learning to Deep learning: Text, Image and Speech Processing (MLDLTISP'18)" at Department of CSE, Sri Venkateswara College of Engineering, Pennalur, Chennai.

Participants: Research scholars, PG students and faculty

1. **Dr. B. Bharathi** - "Speech processing using machine learning and deep learning"

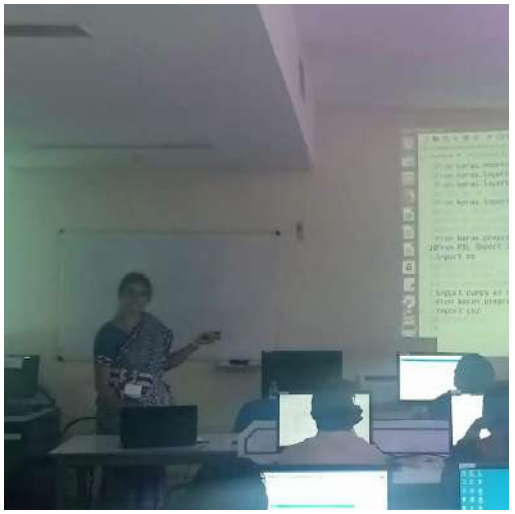
2. **Dr. D. Thenmozhi and Mr. B. Senthilkumar** - "Text processing using machine learning and deep learning"

3. **Dr. P. Mirunalini and Dr. J. Bhuvana** - "Image processing using machine learning and Deep learning in Python"

Our department faculty members delivered talks in the UGC HRDC ASC Refresher Course conducted by the Department of Computer Science, University of Madras on 10 Nov, 2018.

1. **Dr. R. S. Milton** gave a talk on Programming in Python for Machine Learning
2. **Dr. T. T. Mirnalinee** gave a talk on Image processing with CNN

Dr. R S Milton gave a talk on Introduction to Python, NumPy and Pandas in FDP on Data Analytics- Bootcamp with Hands-on using Python.



In the same workshop, **Dr. C. Aravindan** delivered a talk on Introduction to Neural Network, SVM and Deep learning. The corresponding hands-on session on Image classification Using Neural Network and SVM was handled by **Dr. P. Mirunalini**, hands-on on Image classification using CNN was handled by **Dr. J. Bhuvana.**

Dr. R. Kanchana delivered lectures on Service Oriented Architecture - Research issues to the faculty members of IIIT, Una (H.P) and Dept of CSE, NIT, Hamirpur as a part of the seminar organized by IIIT, Una on 1st Dec, 2018

SANCTIONED PROJECT PROPOSALS

The project titled " Development of anti-spoofing method for automatic speaker verification system" submitted by **Dr. B. Bharathi**, received external funding under DST-TARE scheme. Duration : 3 years. Amount: Rs. 16.8 Lakhs

The project titled " An Automated Tool for Early Detection of Depression from Social Media Text for Mental Health using Deep Learning Approach to Assist Student Counsellors and Psychiatrists of Hospitals in India" submitted by **Dr. D. Thenmozhi**, received external funding under DST – EEQ scheme. Duration : 3 Years

PROJECT PROPOSALS SUBMITTED

Dr. Kavitha S., submitted a proposal to AICTE-RPS, titled as "Multimodal Retinal Imaging based Prediction of Memory's Last Breath - Alzheimer" for 3 years Amount: Rs. 11.96 lakhs

Dr. C. Aravindan, Dr. D. Thenmozhi, Dr. J. Bhuvana, Dr. P. Mirunalini along with the Collaborator 'Alphind Software Solutions Private Limited' submitted a proposal to Biotechnology Industry Research Assistance Council (BIRAC) under Social Innovation programme for Products: Affordable & Relevant to Societal Health (SPARSH) scheme, titled: "Ageing and Elderly Assistive Products and Technologies for Behavioural Monitoring, Day-to-Day Essential Services and Life Style Alternatives " for a duration of 18 months. Amount: Rs. 49.45 Lakhs.

EXTERNAL RECOGNITIONS

Dr. P. Mirunalini received Supervisor Recognition from Anna University, Chennai to guide PhD/MS (By Research) students.

Ms. S. Angel Deborah, Assistant Professor has been elected for the position of treasurer in ACM India Chennai Professional Chapter.

PAPER REVIEWS

1. **Dr. J. Bhuvana** reviewed a research paper titled "Discriminative feature learning utilizing a force-based cost function" for the 4th International Conference on Fuzzy Systems and Data Mining (FSDM 2018), Bangkok, Thailand.
2. **Dr. T. T. Mirnalinee** reviewed the papers titled
   a. Detection and classification of mammogram images using K-Means and Fuzzy C-Means clustering algorithm with texture features
   b. Wind Power Forecasting in Short-Term using fuzzy k-means clustering and neural network
   for the conference International Conference on Computing and Information Systems (ICCIS'190 Organized by LICET).
3. **Dr. V. S. Felix Enigo** reviewed a paper titled "How Chronotype Reveals your Channel Preference: An Analysis of Omnichannel Consumer Behavior" for International Journal of Mobile Communications with Thomson Reuters Impact Factor: 1.742
4. **Dr. J. Bhuvana** has reviewed three papers titled, 'Region Based Convolutional Neural Network for Human-Elephant Conflict Management System', 'An elaborate comprehensive survey on recent developments in behaviour based intrusion detection systems' and 'Situation Aware Intrusion Detection System Design for Industrial IoT? Gateways' for ICCIDS 2019.
5. Dr. P. Mirunalini has reviewed a paper titled,"Performance analysis of Convolutional Neural Network (CNN) based Cancerous Skin Lesion Detection System"for ICCIDS 2019.

ACM EVENT ORGANIZED

1. **Dr. Chitra Babu** organized an expert talk by the ACM Distinguished Speaker Dr. Ricardo Baeza-Yates on "Bias in the Web" at IIT Madras on 12th December 2018.

WORKSHOPS ATTENDED

1. **Ms. S. Manisha** attended a workshop on Positive Mentoring conducted by SSN College of Engineering.
2. **Ms. S. Rajalakshmi and Ms. S. Angel Deborah** along with some second year students have attended the ACM Expert talk on "Bias in the Web" by Dr. Ricardo Baeza-Yates, CTO, NTENT(a Semantic Search Technology Company), ACM Distinguished Speaker at IIT Madras on December 12, 2108.
3. **Ms. S. Manisha** attended the NPTEL Mentors Workshop at IIT Madras .
4. **Dr. Chitra Babu, Dr. C. Aravindan, Dr. T. T. Mirnalinee and Mr. B. Senthil Kumar** attended Microsoft Research Academic Research Summit 2019 on Data Science and AI in partnership with ACM-India and the Robert Bosch Centre for Data Science and AI at IIT Madras during 24, 25 Jan 2019.

FACULTY PUBLICATIONS / PRESENTATIONS

1. **Dr. D. Thenmozhi and Dr. C. Aravindan** published a paper titled "RCE-OIE: Open Information Extraction using A Rule-based Clause Extraction Engine for Semantic Applications" in Springer lecture notes on Advances in Intelligent Systems and Computing with book series titled Recent Findings in Intelligent Computing Techniques vol. 709, pp. 191-198, DOI: https://doi.org/10.1007/978-981-10-8633-5_20
2. **Dr. S. Kavitha and Dr. K. K. Thyagharajan** published a journal paper titled as "Fuzzy Qualitative Reasoning Model for Astrocytoma Brain Tumor Grade Diagnosis", Indian Journal of Science and Technology, Vol 11(38), DOI: 10.17485/ijst/2018/v11i38/107253, October 2018, pp:1-13
3. **D Thenmozhi, S Kayalvizhi, Chandrabose Aravindan** published a paper titled "A Machine Learning Approach to Indian Native Language Identification" in CEUR proceedings - Scopus indexed Volume: 2266, pages: 68-76 and D. Thenmozhi presented the same in FIRE 2018 10th international conference at DAIICT, Gujarat.
4. **D. Thenmozhi , A Kalaivani, Chandrabose Aravindan** published a paper titled "Multi-lingual Author Profiling on SMS Messages using Machine Learning Approach with Statistical Feature Selection" in CEUR proceedings - Scopus indexed Volume: 2266, pages: 223-231 and D. Thenmozhi presented the same in FIRE 2018 10th international conference at DAIICT, Gujarat. It is part of the track and we have secured second place in this task.
5. **D. Thenmozhi, B. Senthil Kumar, Chandrabose Aravindan** published a paper titled "SSN_NLP@IECSIL-FIRE-2018: Deep Learning Approach to Named Entity Recognition and Relation Extraction for Conversational Systems in Indian Languages" in CEUR proceedings - Scopus indexed Volume: 2266, pages: 187-201. The paper was presented in the 10th Annual Meeting of the Forum for Information Retrieval Evaluation - FIRE 2018 - An international conference at DAIICT, Gandhinagar, Gujarat. Our system was ranked First among all the submissions in the task.
6. **D. Thenmozhi, B. Senthil Kumar, Chandrabose Aravindan** published a paper titled "Deep Learning Approach to English-Tamil and Hindi-Tamil Verb Phrase Translations" in CEUR proceedings - Scopus indexed Volume: 2266, pages: 323-331. It is part of the track and we have secured third place in the task.
7. **B. Bharathi, J.Bhuvana** presented a paper titled "Statistical testing based feature selection for Native Language Identification" in FIRE 2018, an international conference at DAIICT, Gandhinagar, Gujarat. Same is published in CEUR proceedings - Scopus indexed with Volume: 2266, pages: 59-67. It is part of the track and we have secured FIRST place in the 'Indian Native Language Identification' shared task.

8. **Lokeswari Venkataramana, Shomona Gracia Jacob, Saraswathi S and Athilakshmi R** have presented a paper titled "Clinical Decision Support System for Neuro-Degenerative Disorders: An Optimal Feature Selective Classifier and Identification of Predictor Markers" in the 18th International Conference on Intelligent Systems Design and Applications (ISDA) held in VIT, Vellore, India during 6-7 December 2018.
9. **S. Kavitha, S. Mohanavalli and B. Bharathi,** presented a paper titled as "Predicting Learning Behaviour of Online Course Learners' using Hybrid Deep Learning Model" in 6th IEEE International Conference on MITE 2018, at MLR Institute of Technology, Hyderabad and received "Best paper award" of that track.
10. **Ms. Manisha S. and Dr. T. Sree Sharmila** have presented a paper titled "Recognition of Characters in a Securely Transmitted Medical Image" in the International Conference on Computer Networks, Big Data and IoT (ICCBI 2018)held in VCE, Madurai, India during 19, 20 December 2018
11. **Dhanushree, M., Priyadharsini, R. & Sree Sharmila T**, published paper titled "Acoustic image denoising using various spatial filtering techniques" in International journal of information Technology. 1st January 2019, Springer. https://doi.org/10.1007/s41870-018-0272-3, Online ISSN 2511-2112
12. **S Angel Deborah, S Rajalakshmi, Sivagami, Sounderyan, Sricharan, Sreenidhi, Uttam Raj** presented a paper titled, "Air Quality Detection And Intelligent route Suggestion using IOT And Data Analytics", in Proceedings of International Conference on Mathematical Computer Engineering (ICMCE 2018), VIT University, Chennai on November 23 and 24, 2018 p:280
13. **Dhana Lakshmi M., Mirunalini P., Priyadharsini R., Mirnalinee T.T.** published paper titled "Review of Feature Extraction and Matching Methods for Drone Image Stitching. In: Proceedings of the International Conference on ISMAC in Computational Vision and Bio-Engineering 2018 (ISMAC-CVB). ISMAC 2018. Lecture Notes in Computational Vision and Biomechanics, vol 30. Springer, Cham, 1st online: 02 January 2019, https://doi.org/10.1007/978-3-030-00665-5_59, Online ISSN 978-3-030-00665-5
14. **Sathya Madhusudhanan**, **Suresh J**, paper titled, "Incremental Learning for Classification of Unstructured Data Using Extreme Learning Machine", is shortlisted in ACM IRISS 2019 (13th Inter-Research-Institute Student Seminar in Computer Science).

DATA ANALYTICS – A BOOTCAMP USING PYTHON

We have attended the FDP on "Data analytics – A bootcamp using python", conducted by Department of Information Technology, SSN College of Engineering during 26th to 30th of November 2018.

The first day has started with the application of mathematical concepts like Probability and Statistics in data analytic application by Dr. Srinivasan, Professor, Department of IT, SSNCE. Further, there were sessions related to the introduction to basic python programming, the packages Numpy and Pandas. This session was handled by Dr. R. S. Milton, Professor, Department of CSE, SSNCE. Further, there was a session on the exploration of data in order to preprocess them before the application of machine learning techniques.

On the second day, Mr. Ganesh Babu Jayaraman, Founder & Chief architect, Thingks Informatics LLP has introduced the basic concepts of Linear and Non-linear regression along with a tutorial session on multiple linear regression with sample dataset. The session Multivariate Data Analysis was handled by Dr. T. Girija, Assistant Professor, SSN School of Management which was about the interpretation of the output in data analytic application. Further, there was a hands-on session using ANOVA by Ms. Sadhana Srinivasan, R&D Section, Saama Technologies.

During the third day, there were sessions on clustering and visualization along with the hands-on sessions. On the fourth day, the classifiers such as Logistic Regression, Decision Tree and Naive Bayes were discussed in detail. In addition, how to ensemble these techniques to improve the performance of the model also were discussed. This session was handled by Dr. A. Shahina, Professor, Department of IT, SSNCE. Further, there were sessions on Handling data in Large Scale by Mr. S. Muthuraman, Software Developer, Latentview Analytics and Dimensionality Reduction Techniques by Dr. Syed, VIT, Chennai along with hands-on sessions

On the final day, Dr. C. Aravindan, Professor, CSE, SSNCE has detailed the concepts like neural networks, and support vector machines. Further, we also had a session on introduction to Deep learning, Convolutional neural networks, and research issues in processing the images. There were hands-on sessions for classifying the images using neural and deep neural networks by Dr. P. Mirunalini and Dr. J. Bhuvana, Associate Professors, Dept. of CSE, SSNCE respectively.

Dr. B. Prabavathy & Ms. S. Rajalakshmi

FIRE - 2018

Information Retrieval Society of India organized an International conference on FIRE – Forum of Information Retrieval and Evaluation at Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhi Nagar, Gujarat during 6-9 December, 2018. Tutorials on "Deep Learning Based Approach to Build a Conversational Agent and Practical Challenges" by AI & Research division in Microsoft India and USA and "Knowledge graphs and Information Retrieval: A symbiotic relationship" by IBM India Research Lab were conducted on 6th December.

Several invited talks were given by the experts from academia and industry. Nicola Ferro from University of Padua, Italy, Allan Hanbury from TU Wien, Austria, Gareth Jones from Dublin City University, Jaap Kamps from University of Amsterdam, The Netherlands, Doug Oard from University of Maryland, USA, Paulo Quaresma from Universidade de Évora, Portugal, Stephen Robertson from City University, London, Karin Verspoor from University of Melbourne, Pavel Pecina from Charles University, Prague, Pushpak Bhattacharya from IIT Patna, India, Shourya Roy from American Express, India gave the talks on several fields of information retrieval.

In the conference, 9 papers were presented by researchers from India, South Africa and Germany. FIRE also organized 6 tracks in the fields of Event Extraction from Newswires and Social Media Text in Indian Languages (EventXtract-IL), Information Extractor for Conversational Systems in Indian Languages (IECSIL), Information Retrieval from Microblogs during Disasters (IRMiDis), Multi-lingual Author Profiling on SMS Messages (MAPonSMS), Verb Phrase Translation in English and Indian languages (VPT-IL), Indian Native Language Identification (INLI) along with the conference. Track overviews were given by the task organizers and several works on each task have been presented in the conference. Five different papers were presented in the conference.

Dr. D. Thenmozhi, Mr. B. Senthil Kumar, Dr. B. Bharathi and Dr. J.Bhuvana

CONGRATULATIONS

Ph.D. Viva-Voce Examination of **Leo R** supervised by **Dr. R. S. Milton** was held on 5th October 2018.

Under the guidance of **Dr. Ruba Soundar K**, HoD of CSE department, P.S.R. Engineering College, **Ms. K. Lekshmi** defended her research work during her viva-voce held at CSE seminar hall, PSRCE, Sivakasi.

SONA COLLEGE OF TECHNOLOGY
TEAM VISIT TO SSN

The following faculty members from Sona College of Technology, Salem, Tamil Nadu visited SSN on 12th Nov, 2018 to study the best practices followed at SSN.

1. Dr. M. Usha, Senior Dean, I&C, Prof, CSE, Head SonaNET
2. Dr. J. Akilandeswari, Prof. and Head, IT

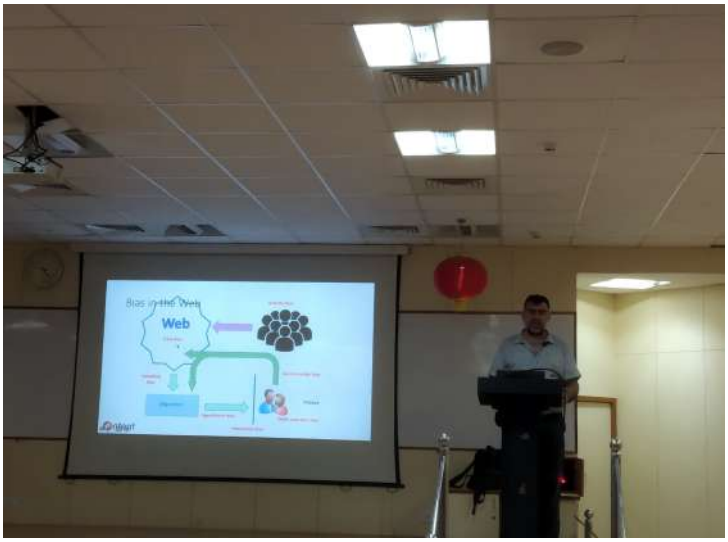
Dr. R. Kanchana as instructed by the Principal, guided the team to Mr. Sriram, Placement Manager, Mr. Amit Tyagi, Asst. Director (Marketing), Ms. Nanda, Student Counselor, Dr. Thenmozhi, ISO coordinator, CSE. The team studied the teaching learning practices, research initiatives, placement strategies, faculty development practices and incentives, and NBA related practices. The team also had discussions with our Principal.

Dr. R. Kanchana

Asso. Prof/CSE

ACM EXPERT TALK ON "BIAS IN THE WEB"

ACM India Chennai Professional Chapter's Expert Lecture on "Bias in the Web" by Dr. Ricardo Baeza-Yates of NTENT was held at IIT Madras on 12th December. It was organised by Dr.Chitra Babu, Vice-Chair, ACM India Chennai Professional Chapter. Eight second year students, Ms. S. Rajalakshmi, Ms. S. Angel Deborah of CSE department attended this lecture.



The Web is an amplified mirror of our society. Thus, the contents and news in the web also is a reflection of the biases that exist in the society. For a computer scientist, the biases are important to study as it would help us to feed less biased data to the ocean of resources and keep it away from biased collapse, as a famous statistician said there are three lies; lies and done lies and statistics.

This can be understood from the example of placing a statistician with his head in an oven and his leg in a freezer. When asked how he felt he would reply on an average he feels okay. So technically biases are the significant deviations from the prior distribution, a distribution that might be unknown. The major mistake we do in using data is that we analyse the data with respect to some individuals and extrapolate It to the whole universe. For example, the Twitter data. As many as countless elections results are predicted wrong year by year with Twitter data. There are a lot of bias in here: technological bias, economical bias, educational bias, political bias, geographical bias etc. the question then asked would be how to make sure the system is fair or neutral with respect to the biases. And who decides what is fair?

This opens up more questions on the measure of bias. There are different kinds of biases. Content or data biases are the biggest of all in quantity. Cultural biases, linguistic biases, geographical biases and gender bias are the major contributors of content or data bias. Well, gender bias can be estimated to be because lesser women in the content and creation segment of the public domain. The study says that around 70% of the main journalists in US are men and also around 90% of the content on Wikipedia is published by men (also vonsidering the safety provided to women on the web).

Example of Chile is also chilling, as the majority of the population resides in the capital and this would mean more news content will be generated from the politically powerful majority. Linguistic bias is also interesting to be noticed: as many as 27 % of the users in web prefer English, that is they would generate and verify content in English(so English content would be better) but around 50 % of the content is in English. So the other language users would suffer poor content. Next comes activity bias. This is due to the activity or human interactions.

Most of the users on a social media platform are passive and a very few generate data. If we look at the data analysed Facebook has around 50 % of its content posted by 7% of the users. And this also is true for Amazon reviews where 4% of users generate half the reviews for payment. Wikipedia shows a positive bias in this respect with around 0.04% generate content which means a small pool of people is collecting data for mass recovery. There are a few research materials in this. How do we distinguish the fake reviews from the innocent ones? What algorithm would we use to rate the quality of the content?

There is something the speaker quotes a digital desert wherein he shows that around 31 % of the Wikipedia content that is changed in a month is not viewed in the next month. Algorithmic biases are the system biases that get added up with the human biases. Speaker showed a very eye-opening prospect of the importance of the right amount sample to be able to draw the right kind of conclusions.

The standard binomial error formula would work very well when the p is tending towards ½ but in the real scenarios where the p is tending largely to 0 then sample space shrinks giving us a wrong conclusion with the limited data sample set. A very common example would be the upload of the web content.

Many sites offer the content makers with system generated tags which the user can use. But the underlying threat in this scenario is that when the user stops giving the tags himself and heavily depend on the system generated tags there would be no data for the system to study from. There is another category of interaction bias which is highly overlapping with our activity biases. Presentation biases, scroll biases, click biases, position biases and the ranking biases are the most common types. Most of the web pages would have a highly predictable space of higher click rates. Every click is money and so the clicks matter. The above-mentioned biases would unevenly distribute the click and some products would enjoy added luxury over others. Second order biases are the worst kind of biases a system can have.

An appropriate example would be the case of writing a blog the content maker decides to query the topics to generate. Ending up with some links from the very first page of querying the content is generated with some rearrangement which makes sense and some added content to fill publishes the content. This would lead to reinforcing the existent biases of the system with the data that exist within it on a much deeper level, the only hope of relief being the fact that anything on the web is traceable. But bias is not always bad. The search engines and web pages and e-commerce run because of the biases. With the age of Internet of Things (IoT), it becomes even more significant to know what a biased web could do in reality.

Riya Raju

II year CSE 'B'

ACM EXPERT TALK ON "SECURITY AND TRUST"

ACM India Chennai Professional Chapter's Expert Lecture on "Security and Trust" by Mr. Kaarthik Sivakumar, Principal Scientist, Service Provider Security Division, Cisco Systems India, was held on 30th November 2018 Alladi Ramakrishnan Hall, Institute of Mathematical Sciences(IMSc), Chennai.

APPROVED INTERNALLY FUNDED FACULTY PROJECTS 2018-2019

S.No	PI / Co - PI	Title of the Project	Duration
1	Dr. B. Prabavathy Dr. Chitra Babu	Intelligent clinical decision support system using deduplication of big data in healthcare domain	2 Years
2	Dr. J. Bhuvana Dr. T.T. Mirnalinee	Wildlife surveillance for monitoring agricultural fields and residential area	2 Years
3	Dr. J. Vijay BME Dr. S. Saraswathi CSE Dr. S. Arun Karthick BME	Design and development of wearable textronic system for monitoring physiological parameters	2 Years 6 Months

ACADEMIC RESEARCH SUMMIT 2019
DATA SCIENCE AND AI

The Microsoft Research (MSR) is organised the fourth edition of the Academic Research Summit, in partnership with the Association for Computing Machinery (ACM) India and the Robert Bosch Centre for Data Science and AI at IIT Madras. The summit was held during 24th and 25th of January 2019 at the ICSR Auditorium in IIT Madras. The day started with the talk by Dr. Raghu Ramakrishnan – an eminent scholar and a well-known person in database community – on Cloud + Data + ML: Opportunities and Challenges. The talk focussed on the impact of breakthroughs in machine learning techniques, scale-out storage and analytics, and cost-effective cloud services provide a shift in computing paradigm. Now data is an asset. AI with its wide range of techniques from ML, DNN, big data and cloud infrastructure assists in realizing the value of data. These challenges provide the opportunity for the business and academia to rethink its strategies in radically different and data-driven way.

Then followed by the plenary talk on Program Synthesis meets Machine Learning by Sriram Rajamani, MD, Microsoft Research India. He compared the program synthesis – formulated by Church, 1957 – with supervised machine learning techniques. He discussed the opportunities at the intersection of program synthesis and machine learning.

Next, there was a track on Systems support for AI which was moderated by Chandu Thekkath, Microsoft. The track mainly focussed on the requirements at the hardware, software level due to the recent developments in AI and its techniques. First, talk was delivered by Timothy, Professor from ETH Zurich. He discussed the need for architectural change in the future machines that scales due to its complexity and diversity of modern hardware platforms. He discussed the design of the systems that was developed at ETH Zurich that address the computational complexity and heterogeneous architectures. Next, Muthian Sivathanu, Microsoft Research delivered a talk on two frameworks for DNN: Gandiva and Astra. Gandiva is a new cluster scheduling framework that utilizes domain-specific knowledge of deep learning to improve the efficiency of training deep learning models in a GPU cluster. Astra is a compilation and execution framework that optimizes

execution of a deep learning training job. Instead of treating the computation as a generic data flow graph, Astra exploits domain knowledge about deep learning training to adopt a custom approach to compiler optimization. This was followed by Nishanth Chandran, Microsoft Research, discussed the issues on sharing the data in cloud platforms for computing some statistical information from the sensitive data. Privacy regulations forbid them from sharing data in the clear with any entity. So, can they compute this information while keeping their private data encrypted (or "hidden") from each other? Cryptography and specifically, the primitive Secure Multi-Party Computation, provides an answer to this seemingly impossible task using sophisticated mathematical protocols.

Followed by this, there was a panel discussion on Challenges and Opportunities in AI moderated by PJ Narayanan, Director, IIIT-Hyderabad. The panel threw some perspectives on the challenges that still persist in the application of AI tools across different areas. Dr Shankar Narasimhan, professor, IITM explained the issues in chemical plants such as design and control of chemical processes. Dr. V. Ravi from IDRBT, Hyderabad discussed some of the issues in banking sector and the use of AI in bankruptcy prediction, fraud analytics, sentiment analysis of customers.

The second day started with enlightening talk by Dr. Sunita Sarawagi, Professor, IIT-Bombay on Redesigning Neural Architectures for Sequence to Sequence Learning. She presented a Posterior Attention Network for a more transparent joint attention that provides easy gains on several translations and morphological inflection tasks. Then she exposed the mis-calibration in the well-known NMT systems, and the fix is by a simple beam approximation of the joint distribution between attention and output which is an easy, accurate, and efficient attention mechanism for sequence to sequence learning.

Next is the Industry talk by Varun Aggarwal, Co-Founder, Aspiring Minds on Using AI in the industry, sprucing up academia. He mainly highlighted the opportunities in using AI in the industry, the challenges and pitfalls. He also stressed the gaps in science policy in India based on his recent book. These seriously impede India's AI efforts, which need to be immediately addressed.

Next, the track on AI for Societal Impact was moderated by Amit Sharma, Microsoft Research. The track was participated by Dr. Kameswari, professor, IIT-Bombay, Ms.Purvi Shah, Head – Digital initiatives at Pratham Books, Saket Anand, professor, IIIT-Delhi. This track mainly focussed on the use of AI for social issues. Dr. Kameswari explained the use of AI in detecting fraud news in social media. Purvi Shah explained her NGOs digital initiatives towards producing digital books to enrich the children's education using AI.

The summit was ended by the track: Technologies for India, hosted by Dr. Hemant Pande, Executive Director, ACM India. The track speakers were P S. Nair from TeamIndus, Saurabh and Siddharth Shetty from iSPIRT.

This Research Summit was attended by me, Dr. C. Aravindan, Dr. Chitra Babu, Dr. T. T. Mirnalinee madam, and few students from our department.

Mr. B. Senthil Kumar
AP/CSE

VISIT TO UNIVERSITIES IN SINGAPORE

As SNU, Chennai is going to be admitting students from coming academic year and engineering is going to be very much a part of it along with programs in Mathematics, economics and Commerce, our management had arranged for a visit to prominent universities such as National university of Singapore(NUS), Nanyang Technological University(NTU) and the Singapore campus of Newcastle University, UK to learn the global best practices.

The following are the few aspects which caught our attention in NUS. There is a lot of study space available in the corridors. Nice desks and chairs are provided for students to sit and work alone or work in groups. Students are very serious in attending classes. They hardly miss the classes. There is a lot of emphasis on continuous assessment and class participation. I would very much love to see this trend in the upcoming university.

The Innovation & Design Program (iDP) is offered as a second major along with some other primary Major. As part of this, the students will be learning Design Thinking, Innovation Framework, Design Methodology, building a PoC prototype and do a complete final year project. Ten percent of the engineering student population seems to be enrolling for this iDP as a second Major. iDP studio provides a conducive environment for creative brain-storming and exploring design alternatives.

We visited the Centre for Development of Teaching and Learning(CDTL). This centre caters to the needs of all the departments. They work hand-in-hand with the technical faculty to maximize the learning effectiveness and to provide the best learning experience. For measuring the teaching impact, indicators such as student perception, peer perception and deep self-reflection are used.

An interesting practice was at the end of every course, the students have to self-assess themselves and answer 5 questions from the perspective of what they learnt in the course. This is also used in showing the attainment of course and program outcomes with respect to the process of accreditation.

Center for English Language Communication(CELC) plays an important role and works together with engineering faculty to embed communication skills in an engineering course.

Technical presentations of students are videographed and feedback is given to them for improvement. The scores given by CELC will be consolidated by the technical faculty with the rest of the assessment components. Great motivator and strategy for improving the report writing and technical presentation skills!

An interesting mindset was that the university is not responsible for placing the students. It is only responsible for imparting the necessary skills. The university regularly conducts job fairs which provide an opportunity to bring students and potential employers together.However, following up with companies, attending interviews and obtaining a job is the responsibility of students. As a result, students in their final year do not miss classes or tests for placement related reasons.

"Innovation and Design" class handled by Dr. Prahlad at NUS

Photograph taken at the

Centre for Development of Teaching & Learning(CDTL), NUS

L-R:

Mr. Alan Soong Swee Kit, Associate Director(Learning Design and Research), CDTL, NUS, Dr. V. Kamaraj, Dr. V. E. Annamalai, Dr. S. Salivahanan, Mrs. Kala Vijayakumar, Mr. Johan Geertsema, Director of CDTL, Dr. Shashikant Albal , Dr. Chitra Babu, Dr. S. Radha, Dr. Prahlad Vadakkepet, Professor in the School of Electrical and Computer Engineering

In NTU, under NTU-India connect program, student internships are available. Students with a minimum CGPA of 8.5 can apply for the same. The second Singapore-India Hackathon has been planned at IIT Madras during September 2019. Interested students can watch out for this announcement.

In the Newcastle University, Singapore campus, Electrical, Mechanical, Chemical and Marine engineering programs are offered. We visited Newcastle Research and Innovation Institute.

Dr. Chitra Babu

HoD / CSE

RITA-2018

2018 winter was indeed a turning point as our work on image processing was selected in a springer conference held at Putrajaya, Malaysia. First, we would like to thank our guide Mrs. R. Priyadharsini, AP of Computer Science Department for being a constant support and instilling our minds with avid interest in the area of research.

The work titled "Brain Tumour Detection and Classification using K-means Clustering and SVM Classifier" was accepted in the '6thinternational robot intelligence technology and applications'.

It was a wonderful experience to be a part of the conference as it gave us opportunities to contact with PhD scholars, co-researchers, industry personnel and professors of esteemed universities in Malaysia and Singapore.

The three day conference was held from December 16th - 18th 2018. Due to the semester exam, we were able to make up to the conference on the 2nd day on the same day when our presentation was also scheduled. The day began with a Plenary talk on "Recent advances and challenges in Deep Learning for computer vision" by professor Junmo Kim. His talk inspired us with a totally different insight of the advancement in deep learning along with its challenges. It was followed by another technically advanced talk by Marcelo H Ang, professor of National University of Singapore, whose works on smart transportation in Singapore was awestrucking as it takes the mode of public transport to another level.

The conference had a touch of both mechanical and computer science because of which we obtained a brighter vision on the application of computer science technologies in various other fields. After the talks, we presented our work.

The third day was scheduled for a technical tour where only a selected number of attendees were taken to 'MIMOS' and we were among them. MIMOS is Malaysia's national Applied Research and Development Centre. As a strategic agency under the Ministry of International Trade and Industry (MITI), MIMOS contributes to raising Malaysia's competitiveness by pioneering market creation for Malaysian technopreneurs through patentable technology platforms, products and solutions. Both software and hardware technology of the company was of much advanced which gave us a great takeaway from the tour.

On the whole, the conference not only inspired us but also helped us build a good friendship and bondage with people from different parts of the world.

Sharath Chander P and Soundarya J
III year CSE-B

Megha Vora Research Scholar of **Dr. T. T. Mirnalinee** bagged Best Oral Presentation Award held at SSN Doctorate Scholars Day - 2018 during 11-12 Dec 2018. The award was received by Dr. T. T. Mirnalinee.

INTERNATIONAL CONFERENCE ON MACHINE VISION 2018 - GERMANY

Three other peers (Aarif Noordeen, Bhaskar Venkatraman, Harish Ravi) and I were working on a project titled " Optical Character Recognition for Printed Tamil Characters" under the guidance of Dr R S Milton. We designed a hierarchical classifier to tackle the inherent hierarchy in the language which led to good results (99.8% accuracy). These results motivated us to write a paper which was then accepted at the International Conference in Machine Vision, 2018. The conference was held in Munich, Germany and I went to present our work as one of the first authors. It was a two day conference held during November 1-3, 2018.

The first day consisted of various key note speakers who discussed about their prominent research in different field ranging from optics to Biomedical Imaging. It was an eye opener and helped me understand some other prospects of research in Machine Vision.

The second day consisted of separate forums for different topics of the research papers accepted. I understood the way people presented to a live audience and made sure I did a better job. After my presentation, I asked many people for opinions since it was detrimental to performing a better job the next time around. Overall, I met people from different cultures, different countries and engaged in all kinds of conversations with them. I then attended other forums to hear some people who had submitted some interesting work. I realised a lot of potential for research in different areas, different kinds of applications, different approaches adopted by people to tackle a problem. On another note, Munich was a wonderful place to visit. The beautiful structures, the rich history behind the figurines can cause people to be awestruck. Finally, It was a wonderful opportunity for me to get out of my comfort zone and engage in different fruitful activities to augment my knowledge.

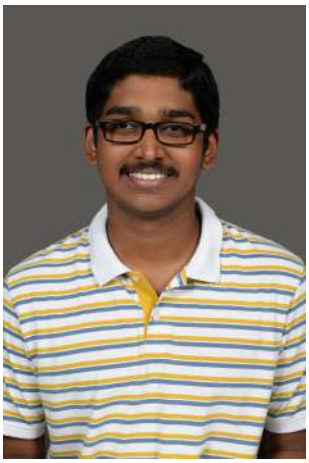
Kawshik Kannan

IV Year CSE

STUDENT ACHIEVEMENTS

Major League Hackathon's Local Hack Day took place on the 1st of December, 2018 lasting 14 hours, a relatively short hackathon. Through the duration of the hackathon the team managed to build an android app, Calmity that helps connect people who want to help but don't know who to help, and people who need help but don't know where to get help from. The entire app was built using android studio and the team was placed in the Top 5 Teams.

School of Excellence in Law held a Model United Nations on the 5th and 6th of January where Rohit Midha was the Vice Chair of the Economic and Social Council. In this session of the MUN, the council discussed "Addressing inequalities and challenges to social inclusion through fiscal, wage and social protection policies".



Sanjay Thiruvengadam, II year CSE participated in the 11th Chennai Open International Grandmaster Chess Tournament 2019 for Sakthi Group Dr. N. Mahalingam Trophy held at NOVOTEL & IBIS Chennai OMR, Shollinganallur from 18th to 25th January 2019. He scored 5.5 points out of 10 rounds.

PLACEMENT

Northern Arc Capital	Apoorva N

INTERNSHIPS

S.NO	Name of the student	Organization
1	Nirupan Ananthamurugan	Mad Street Den
2	Mahima M	Viasat India Pvt Ltd.
3	Sathiya Narayan C	Caterpillar
4	Vignesh Kumar V	Zoho
5	Pooja Priya V	Paypal
6	Venkatesh S	Fourkites
7	Kaushik S	Coda Global
8	Ashwin Krishnan G	Fourkites
9	Adithya Ganesan	MotorQ
10	Aakash S	ChargeBee
11	Seethalakshmi B	Coda Global
12	Harieharaan D	Sirius Computers
13	J Vigneshwara Prakash	Harphil Software Solutions
14	Shreyas Gopal	Admatic Technologies
15	Vishal Gupta	Freshworks

COST-AWARE RESOURCE MANAGEMENT FOR GEO-DISTRIBUTED CLOUD AND EDGE COMPUTING

The students of 3rd year CSE were happy to attend the guest lecture delivered by Dr Balaji Palanisamy who is an Assistant Professor in the School of Computing and Information, University of Pittsburgh. He is a recipient of the IBM Faculty Award in 2017. The topic of the guest lecture was Cost-aware Resource Management for Geo-distributed Cloud and Edge Computing. Dr Palanisamy spoke about how in the era of Big Data, geo-distributed cloud computing and edge computing provides a seamless service delivery model for applications with low latency. He talked about the evolution of small-scale microdata centers to large-scale geo-distributed data centers and the challenges they raised like ineffective global resource sharing and management of independently controlled data center resources and why moving towards a globally efficient resource allocation model is necessary.

He discussed how individual providers(individual data centers)based on established contracts, employed a contract-cost and duration-aware job scheduling and provisioning algorithm that will enable jobs to complete and meet their response time requirements. He moved on to speak about Edge Computing and how it fills latency gaps between end IoT devices and the back-end computing infrastructure. He talked about Zenith, a model for allocating computing resources in Edge Computing platform. He explained how this model has latency-aware scheduling which gives high efficiency in resource allocation.

The session was an enlightening talk that gave us an insight into Cloud and Edge Computing. At the end, there was a Q&A session where Dr Palanisamy cleared all the doubts put forth by the students. He concluded the session by talking about the various opportunities for higher studies at University of Pittsburgh.

Hariny G

III year CSE

ALUMNI UPDATE

Anandh Varadarajan (Batch: 2011-2015), who was working with SAP SuccessFactors, Bengaluru, India as Software Development Engineer in test from July 2015 to December 2018 has recently got admitted as Graduate Student at Stony Brook University, New York.

REACHED THE GOAL

I started preparing for CAT a bit over a year before the exam. I joined the institute Dreamchasers after exploring different options. One of the most important characteristic I held throughout my preparation was determination. I started with Quants prep and after getting comfortable with that section,I moved on to Verbal and then focused on Logical reasoning. Throughout, I had my mentor,my parents and my closest friends motivating and pushing me to work really hard.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99.99 சதவீதம் மதிப்பெண் பெற்று சாதனை

It was a wonderful experience and I feel really happy about having borne the fruits of my efforts.

Aakash S
IV Year CSE

WORDS FROM NEELA

Neela recently graduated from the NC State University with a Masters in Computer Science, specializing in Data Analytics. She now works as a Data Scientist in the Advanced Analytics team for Artificial Intelligence at SAS, creating AI applications for solving customers' complex business problems. She has varied experience in Machine Learning and Artificial Intelligence. Some of her recent work include - Ensemble Model training and Hyper-parameter auto-tuning, building Deep Neural Networks for Object Detection and Image Classification. Neela has also authored a white paper – "Deep Learning Demystified", a guide to Deep Learning and building Deep Learning models in SAS.

Neela Niranjani
(Batch 2011-2015)

TRIBUTE -2019

SSN Annual Alumni meet, Tribute was held on 5th January 2019.

From Left to Right: Mohammed Yousuf, Winston Richards, Manoj Prabhakar, Prasanna Venkatesan and Manoj Mahalingam(Batch: 2005-2009)

SSN Alumni Association honoured the Faculty In-Charges for their active participation in Networking Alumnus with SSN.

SSN SCHOLARSHIP DAY - 2018 A GLIMPSE

SSN Scholarship Day for the year 2018 was held on December 19, 2018. Few students from our department received different merit scholarships.

Suryakanth M, IV Year receving Walk In Walk Out - (WIWO) Scholarship.

Sarah Mathew, III Year receving Merit - Exemplary Scholarship.

Priyanka V, III Year receving Walk In Walk Out - (WIWO) Scholarship.

Jothishmathi C V, II Year receving Walk In Walk Out - (WIWO) Scholarship.

UNIVERSITY RANKS - UG

S.NO	STUDENT NAME		UNIVERSITY RANK
1	ANJANA S		15
2	APARNA A		17
3	PRIYANKHA B		20
4	AVANTHIKAA RAVICHANDRAN		30
5	ASHWINI RAJA		31

UNIVERSITY RANKS - UG

S.NO	STUDENT NAME		UNIVERSITY RANK
6	SAHITYA SRIDHAR		31
7	AVINASH BHARAT		33
8	SIMRAN MODI		33
9	PREETHAA K GANESH		39
10	SIVAGAMI S N		40

UNIVERSITY RANKS - UG

S.NO	STUDENT NAME		UNIVERSITY RANK
11	RAGHAV NANDAKUMAR		45
12	DODDA SAISUMA		50

UNIVERSITY RANKS - PG

S.NO	STUDENT NAME		UNIVERSITY RANK
1	BAPUSIRI B		43
2	DHANALAKSHMI M		44

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III YEAR

HARINY G

SHREYAS S