

## Dr. Oswald C.

Post Doctoral Fellow, **Machine Learning and Data Mining Research Lab**  
Department of Computer Science and Engineering  
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### Research Interests

#### **Data Science/Data Compression -**

- Mining Frequent/Closed/Maximal patterns and clusters from large texts and images
- Design of smart multimedia(Text/Image/Video) compression algorithms based on Pattern Mining
- Design of Novel CAPTCHA's for secure authentication

### Education

**Post Doctoral Fellow, Dept. of Computer Science and Engineering, Indian Institute of Technology Kanpur,**  
Mentor: Prof. Arnab Bhattacharya  
Feb 2021 – till now

**Ph.D. in Computer Science and Engineering, Indian Institute of Information Technology, Design and Manufacturing Kancheepuram**  
Dissertation Topic: “*Efficient Algorithms for text and image compression based on Knowledge Engineering*”  
Advisor: B. Sivaselvan  
July 2013 - Nov 2018

**M.Tech. (Master of Technology) in Software Engineering, Karunya University [8.7/10, Rank Holder].**  
Dissertation Topic: “*Hybrid Particle Swarm Optimization for University Course Timetabling Problem*”  
Received **Best paper** Award at 5<sup>th</sup> ICoAC 2015.  
July 2011 - May 2013

**B.E. (Bachelor of Engineering) in Computer Science and Engineering, Sona College of Technology, Anna University [8.4/10, Best Co-curricular Student].**  
June 2005 – May 2009

### Professional Experience

**Assistant Professor–Senior, School of Computer Science and Engineering, VIT Chennai.**  
June 2019 – February 2021

**Assistant Professor, Department of Computer Science and Engineering, SRM IST, Chennai**  
June 2018 – May 2019

**Intern, IBM India Systems & Software Lab, Bangalore.**  
In: IBM AIX – Functional Verification Testing (FVT)  
Dec 2012 – July 2013

**Programmer Analyst, Cognizant Technology Solutions, Chennai.**  
In: Development of Client Softwares and Maintenance  
Dec 2009 – May 2011

## Indian Patents Published

1. Oswald C, M. Mohamad Fasil Ansaary, P. Raghava Ratna, *An Integrated System and Method for a Touchless, Paperless Election Voting for Government and Private mode*, February 05, 2021. File No. **202141003735**.
2. Oswald C, Jayapragash R, Trishit Chakraborty, Tanishq Gupta, Aditya Agrawal, *SPoTA: Smart Prevention of Train Accidents*, August 28, 2020. File No. **202041035035**.
3. Balasundaram A, Manas Ranjan Prusty, Inayathullah M A, Oswald C, *Smart Attendance Marking System (SAMS) using Computer Vision*, July 03, 2020. File No. **202041025660**.

## Publication in Referred Journals

1. C. Oswald and B. Sivaselvan. 2017. *An optimal text compression algorithm based on Frequent Pattern Mining*. Springer Journal of Ambient Intelligence and Humanized Computing. 9, p.1-20. <https://doi.org/10.1007/s12652-017-0540-2>. (IF: 4.5)
2. Oswald, C. & Sivaselvan, B., (2018). *Text and Image Compression based on Data Mining Perspective*. Data Science Journal. 17, p.12. DOI: <http://doi.org/10.5334/dsj-2018-012>. (IF:0.3)
3. Oswald, C., E. Haritha, A. Akash Raja, and B. Sivaselvan. *An efficient and novel data clustering and run length encoding approach to image compression*. Concurrency and Computation: Practice and Experience: e6185. <https://onlinelibrary.wiley.com/doi/10.1002/cpe.6185> (IF:1.4)
4. C. Oswald, B. Sivaselvan, "*Frequent Pattern Mining based Efficient Huffman Encoding using a Hash Structure*" to Applied Artificial Intelligence, Taylor and Francis. (In Review)
5. Hari Krishna Majety, C. Oswald, B. Sivaselvan, "*Smart Multimedia Compressor – Intelligent Algorithms and Interface for Multimedia Compression*" to The Computer Journal. (In Review)
6. Anand Kushwaha, C. Oswald, "*An enhanced military defense system using object recognition in IoT*", to EAI Transactions on Scalable Information Systems. (In Review)
7. Tejaswi Kumar, Navansh Goel, Siddhant Roy, C. Oswald "*A multilayered randomness approach to text and Image CAPTCHA*" to Journal of Human-Computer Interaction, Taylor and Francis. (In Review)

## Publications as Book Chapters

1. Kataria M., Oswald C., Sivaselvan B. (2019) *A Novel Rare Itemset Mining Algorithm Based on Recursive Elimination*. In: Hoda M., Chauhan N., Quadri S., Srivastava P. (eds) Software Engineering. Advances in Intelligent Systems and Computing, vol 731. Springer, Singapore. ISBN: **978-981-10-8848-3**.
2. Oswald C., Akshay Vyas V., Arun Kumar K., Vijay Sri L., Sivaselvan B. (2018) *Hierarchical Clustering Approach to Text Compression*. In: Sa P., Sahoo M., Murugappan M., Wu Y., Majhi B. (eds) Progress in Intelligent Computing Techniques: Theory, Practice, and Applications. Advances in Intelligent Systems and Computing, vol 518. Springer, Singapore. ISBN: **978-981-10-3373-5**.
3. Karthik M., Oswald C., Sivaselvan B. (2018) *Frequent Sequence Mining Approach to Video Compression*. In: Ganapathi G., Subramaniam A., Graña M., Balusamy S., Natarajan R., Ramanathan P. (eds) Computational Intelligence, Cyber Security and Computational Models. Models and Techniques for Intelligent Systems and Automation. ICC3 2017. Communications in Computer and Information Science, vol 844. Springer, Singapore. ISBN: **978-981-13-0716-4**.
4. Tummala K., Oswald C., Sivaselvan B. (2018) *A Frequent and Rare Itemset Mining Approach to Transaction Clustering*. In: R S., Sharma M. (eds) Data Science Analytics and Applications. DaSAA 2017. Communications in Computer and Information Science, vol 804. Springer, Singapore. ISBN: **978-981-10-8603-8**.
5. Avula S., Oswald C., Sivaselvan B. (2018) *Frequent Pattern Mining Guided Tabu Search*. In: R S., Sharma M. (eds) Data Science Analytics and Applications. DaSAA 2017. Communications in Computer and Information Science, vol 804. Springer, Singapore. ISBN: **978-981-10-8603-8**.

6. Oswald C., Ajith Kumar I., Avinash J., Sivaselvan B. (2017) *A Graph-Based Frequent Sequence Mining Approach to Text Compression*. In: Ghosh A., Pal R., Prasath R. (eds) Mining Intelligence and Knowledge Exploration. MIKE 2017. Lecture Notes in Computer Science, vol 10682. Springer, Cham. ISBN: **978-3-319-71928-3**.
7. Oswald C., Ghosh A.I., Sivaselvan B. (2015) *An Efficient Text Compression Algorithm - Data Mining Perspective*. In: Prasath R., Vuppala A., Kathirvalavakumar T. (eds) Mining Intelligence and Knowledge Exploration. MIKE 2015. Lecture Notes in Computer Science, vol 9468. Springer, Cham. ISBN: **978-3-319-26832-3**.

### Publications in Referred Conference Proceedings

1. Tejaswi Kumar, Navansh Goel, Siddhant Roy, C. Oswald “*Usability evaluation of novel text CAPTCHA schemes based on colors and shapes*”, In 4<sup>th</sup> International Conference on Innovative Computing and Communication (ICICC) 2021. (**Best Paper Award**)
2. Moolam Hima Swetha, B. Sivaselvan, C. Oswald, “*Closed Frequent Itemset Mining approach to Image Security Enhancement*”, In IEEE International Conference on Computer, Communication and Signal Processing (ICCCSP), pp. 1-6. IEEE, 2018.
3. Sudheer S, Sivaselvan B, C. Oswald, “*Emergent User Design Framework for E- Payment Mobile Application*”, In 2018 IEEE International Conference on Computer, Communication and Signal Processing (ICCCSP), pp. 1-6. IEEE, 2018.
4. Kuldeep Gunta, B. Sivaselvan, C. Oswald, “*Gamification Paradigm for WebApps Design Framework*”, In IEEE International Conference on Computer, Communication and Signal Processing (ICCCSP), pp. 1-6. IEEE, 2018.
5. Biswas, Subham, Nikhil Chennu, Harsha Valveti, C. Oswald, and B. Sivaselvan. "Lossy Image Compression using Frequent Pattern Mining based Huffman Encoding." In 2017 14th IEEE India Council International Conference (INDICON), pp. 1-6. IEEE, 2017.
6. Neeraj, S., C. Oswald, and B. Sivaselvan. "A Novel Gamification Approach to Recommendation Based Mobile Applications." In 2017 Ninth International Conference on Advanced Computing (ICoAC), pp. 157-164. IEEE, 2017.
7. Krishna Chaurasia, Sowmya Jain, B. Sivaselvan, C. Oswald, “*Automatic Ranking of CAPTCHAs based on Usability Measures*”, In Annual IEEE India Conference (INDICON), pp. 1-6. IEEE, 2017.
8. Kadimisetty, Avinash, C. Oswald, B. Sivaselvan, and Kadimisetty Alekhya. "Lossy image compression—A frequent sequence mining perspective employing efficient clustering." In 2016 13th IEEE Annual India Conference (INDICON), pp. 1-6. IEEE, 2016.
9. Kadimisetty, Avinash, C. Oswald, and B. Sivaselvan. "Frequent Pattern Mining Approach to Image Compression." In 2016 22nd Annual International Conference on Advanced Computing and Communication (ADCOM), pp. 27-32. IEEE, 2016.
10. C. Oswald, Anirban I Ghosh, and B Sivaselvan. *Knowledge engineering perspective of text compression*. In 2015 Annual IEEE India Conference (INDICON). IEEE, 1–6. 2015.
11. Oswald, C., Anand Devadurai, C., "Novel hybrid PSO algorithms with search optimization strategies for a university course timetabling problem." In 2013 Fifth International Conference on Advanced Computing (ICoAC), pp. 77-85. IEEE, 2013. (**Best Paper Award**)

### Projects Developed

**Algorithm Visualizer** - <https://algorithmvisualizer.github.io/AlgoVis/>

Students: Vaibhave S, Shyam Sasidharan Nair, Shyam Sundaram S and Akash A

Department of CSE, VIT Chennai.

**Hungarian Method Visualizer** - <https://hungarianmethod.github.io/HungarianVisualiser.github.io/>

Students: Shubh Todi

Department of CSE, VIT Chennai.

## Awards and Recognitions

Research Excellence Award, VIT Chennai - 2019  
SPOT Light Award from Vice President, Cognizant Tech. – 2011  
Best Undergraduate Co-curricular student Award – 2009  
Best NSS Volunteer Award – 2009

## Courses Taught

Data Structures and Algorithms - Fall 20-21 and Fall 19-20  
Problem Solving and Programming in Python - Fall 20-21, Winter 19-20 and Fall 19-20  
Operating Systems - Fall 20-21  
Software Quality and Reliability - Winter 19-20  
Artificial Intelligence - Fall 18-19  
Software Reliability - Fall 18-19 and Winter 18-19

## Professional Service

**Journal Reviewer** : Data Science Journal, Springer Nature Computer Science, Bentham Science.  
**Conference Reviewer** : ICITSD-2021, CICT 2020, COCONET 2020  
**Professional Bodies** : NASSCOM Certified Student Trainer on “Associate Analytics”.  
Member of the Board of Studies, Sona College of Technology.  
Coordinator, Linux User Group at VIT Chennai.

## Invited Events

- Talk on *Types of Itemsets and their algorithms*, Workshop DAMI' 2018 at IIITDM Kancheepuram.
- CODS'15, CODS'16, VLDB'16, CODS'17 and CODS'18 through travel grants from ACM SIGKDD.
- Talk on *Career Opportunities for budding Engineering Graduates*, at Sona College of Technology, Kongunadu College of Engineering.
- Talk on *Data Science* at Solamalai college of Engineering, Madurai.
- Talk on *An Introduction to Supervised and Unsupervised Learning* at Guru Nanak College and SRM University Chennai.
- Doctoral Committee Member for various Institutes.

## Events Organized

- One Day National Level Workshop on *Pixels on Point* at VIT Chennai on Feb 22, 2020.
- Industrial Guest Lectures on *Data Structures and Algorithms in LinkedIn*, *Problem Solving techniques in Google*, VIT Chennai.

## Referees

Dr. Sivaselvan B,  
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