GAUTAM SIDDHARTH KASHYAP
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Profile

Passionate about innovation, real-world optimization problems, and software learning. Entrepreneurial. Creative and artistic. Patriotic and committed to helping the military and veterans. Insatiably curious. Polymath. Total jocks that need to work out daily. Extremely driven. Sometimes jaded and sarcastic. 100% unconventional. ENTP (Extroversion, Intuition, Thinking, Perception). Lover of literature. Committed to close friends.

Education

Master of Computer Applications (MCA), Jamia Hamdard, New Delhi, India (QS world ranking 700-800)
October 2021- May 2023 (Passed)
GPA: 4.06 (5.0 Grading Scale)
Percentage: 80.31%
MCA Thesis: *Optimizing Artificial Neural Network Training using Metaheuristics: A Comparative Study of Particle Swarm Optimization, Genetic Algorithms, and Particle Swarm Optimization-Stochastic Gradient Descent*. In this thesis, we compare Particle Swarm Optimization (PSO) and Genetic Algorithms (GAs) with Stochastic Gradient Descent (SGD) for training Artificial Neural Networks (ANNs), and present a hybrid PSO-SGD method. We experiment on various network architectures and find that population-based Metaheuristic Optimisers (MHOs) are useful options for training smaller networks. PSO-SGD outperformed both PSO and GA for thinner networks. Additionally, the Building Block Hypothesis (BBH) may hold when using EAs for ANN training, encouraging further study of EAs with emphasis on crossover properties. For more details please see the publication section where the research paper is being published based on this thesis.

BSc Computer Science, Jamia Hamdard, New Delhi, India (QS world ranking 700-800)
August 2018- July 2021 (Passed)
GPA: 4.25 (5.0 Grading Scale)
Percentage: 85.5% (**1st Rank**)
BSc Thesis: *Vehicle routing optimization for supply chain management solved using RWPSO (Particle Swarm Optimization using Roulette Wheel selection method) approach*. In this thesis, we develop a mathematical model for VRPTW which is a variation of the vehicle routing problem that minimizes the transportation cost using the PSO technique with a roulette wheel method (RWPSO) to avoid premature convergence while satisfying some constraints. Furthermore, a computation experiment is also conducted on VRPTW while running the proposed algorithm RWPSO on the Solomon benchmark datasets. For more details please see the publication section where the research paper is being published based on this thesis.

Certificate in Software Testing, TTE Delhi (WCSC), New Delhi, India
July 2017- July 2018 (Passed)
GPA: 3.88 (5.0 Grading Scale)
Percentage: 77.77%

A-Levels/12th CBSE Board, Vandana International School, New Delhi, India
July 2016- July 2017 (Passed)
GPA: 3.41 (5.0 Grading Scale) with Physics, Chemistry, Biology, and Mathematics
Percentage: 68.33%

O-Levels/10th CBSE Board, Vandana International School, New Delhi, India
July 2014- July 2015 (Passed)
GPA: 3.82 (5.0 Grading Scale) with Science, and Mathematics
Percentage: 76.44%

Experience

Research Assistant, Tech Mahindra (Americas) Inc., Texas, USA - (Remotely)
August 2024- October 2024 (Completed)

- Collaborated on research tasks centered around Pre-Trained Models (PTMs), Fully Connected Networks (FCNs), and Convolutional Neural Networks (CNNs) specifically tailored for audio deepfake detection tasks.
- Initiated and explored the incorporation of Generative Adversarial Networks (GANs) into the research, expanding the scope to address new questions related to performance metrics, real-world adaptability, and ethical considerations in synthetic data usage.
- In a process of submitting a conference paper to the Asia ACM Multimedia 24'.

Research Assistant, Microsoft Inc., Texas, USA - (Remotely)
April 2024- July 2024 (Completed)

- Researched various MLOps methods, assessed their features and operability through a review of 22 papers, and identified areas for improvement in achieving fully effective and self-regulating MLOps methods.
- Conducted a comprehensive analysis of LLMs such as GPT and BERT, focusing on their potential impact beyond traditional NLP tasks. Explored innovative applications across diverse domains like fitness, well-being, urban planning, climate modeling, and disaster management, identifying research gaps and envisioning novel uses for LLMs.
- In a process of submitting two journals paper.

Research Assistant, IIIT Delhi, New Delhi, India - (Full Time)
March 2023- March 2024 (Completed)

- In my role as a research assistant working on deepfake analysis, I have been responsible for analyzing audio samples using various Pre-Trained Models (PTMs) such as XVector, Unispeech, XLSR, etc.
- I have also collaborated with the PhD students to develop and test custom tools to detect and analyze deepfake behavior with PTMs.

Freelance Researcher, Upwork (https://www.upwork.com/freelancers/~010bc93e0357cb6309)
October 2021- Ongoing

- Top Rated Freelancer in the category of "Research Paper Writings".
- The job success rate i.e. how well you deliver great results for your clients is 100%.
- In a total of 70 jobs, earned up to $19K+.

Research Assistant, University of Stirling, Stirling, UK - (Remotely)
June 2021- June 2023 (Completed)

- Collaborated for over two years on topics related to metaheuristics and machine learning.
- Published three peer-reviewed book chapters in forthcoming books by Springer and CRC Press/Taylor & Francis.
- Currently have a journal paper titled "Optimization of the rectangle area inside a concave polygon using PSO and Tabu Search" under review with Soft Computing.
- Contributed to a report on arXiv, showcasing the work on incorporating roulette wheel selection into the PSO algorithm.

Intern Computer Programmer, Grahlaxmi International, New Delhi, India - (Part-time)
January 2020- June 2020 (Completed)

- Handled database and Web site programming tasks (primarily using C, C++, HTML, and PHP), working an average of 15 hours per week while maintaining a 4.25 GPA (5.0 Grading Scale).
- I develop and maintain the organization's system software and computing infrastructure.
- Resolved memory corruption and other technical issues by leveraging strengths in coding, debugging, and integration testing.

Intern Web Developer, Recon AppMagic Pvt. Ltd, New Delhi, India - (Full-time)
February 2018- June 2018 (Completed)

- Co-developed a dynamic, secure website from scratch. Launched visually appealing, user-friendly web scape with interactive features to optimize traffic, page views, the site "stickiness" and user experience (UX).
- Created online surveys, contests, and donation forms that boosted funding and organizational visibility.
- I worked alongside a team of other developers in maintaining, and updating our websites.
- Conferring with teams to resolve conflicts, prioritize needs, and develop content.

Projects

Detection of facemask using deep learning methods: prevention of covid-19:

This project used deep learning methods for the detection of a facemask in the real-time scenario for the prevention of Covid-19. Our proposed techniques work for single and multiple people in a frame recorded via webcam in still or in motion. We have also experimented with our approach in night light. The accuracy of our model is good compared to the other approaches in the literature. **Link**: https://github.com/Karan-Malik/FaceMaskDetectorAdvanced. For more details please see the publication section where the research paper is being published based on this project.

Publications (https://scholar.google.com/citations?hl=en&user=p8cdsVoAAAAJ)

SCI-Indexed

1. Liyun Gong, Pandey Shourya Prasad, Chan Chi Leung, **Gautam Siddharth Kashyap**, Syed Waqar Ahmed, Ayush Singh, Shina Samuel Kolawole, Ifeoma Ochi, Miao Yu, Saeid Pourroostaei Ardakani, Ross Clifford and Xujiong Ye, *Innovative Spatial-Temporal Attention Network (STAN) for Skeleton-Based Timed-Up-and-Go Analysis to Stratify Lower Back Pain Severity with Monocular RGB Camera*, IEEE Transactions on Neural Systems and Rehabilitation Engineering (IEEE), 2024 (Under Review).
2. **Gautam Siddharth Kashyap**, Md Tabrez Nafis, and Samar Wazir, *Optimizing Artificial Neural Network Training using Metaheuristics: A Comparative Study of Particle Swarm Optimization, Genetic Algorithms, and Particle Swarm Optimization-Stochastic Gradient Descent*, Sadhana (Springer), 2024 (Under Review).
3. **Gautam Siddharth Kashyap***, Karan Malik, Samar Wazir, and Alexender E.I. Brownlee, *Optimization of the rectangle area inside a concave polygon using PSO and Tabu Search*, Soft Computing (Springer), 2024 (Under Review).
4. **Gautam Siddharth Kashyap***, Deepakshi Mahajan, Orchid Chetia Phukan, Ankit Kumar, Alexender E.I. Brownlee, and Jiechao Gao, *From Simulations to Reality: Enhancing Multi-Robot Exploration for Urban Search and Rescue*, Journal of Supercomputing (Springer), 2023 (Under Review). Available at https://arxiv.org/abs/2311.16958 (Preprint).
5. **Gautam Siddharth Kashyap***, Karan Malik, Samar Wazir, and Rizwan Khan, "Using Machine Learning to Quantify the Multimedia Risk Due to Fuzzing," Multimedia Tools and Applications (Springer), 2021. https://doi.org/10.1007/s11042-021-11558-9

ESCI-Indexed

1. Pravneet Kaur, **Gautam Siddharth Kashyap***, Ankit Kumar, Md Tabrez Nafis, Sandeep Kumar, and Vikrant Shokeen, *From Text to Transformation: A Comprehensive Review of Large Language Models' Versatility*, Discover Sustainability (Springer), 2024 (Under Review). Available at https://arxiv.org/abs/2402.16142 (Preprint).
2. Samar Wazir, **Gautam Siddharth Kashyap***, and Parag Saxena, *MLOps: A review*, Discover Sustainability (Springer), 2023 (Under Review). Available at https://arxiv.org/abs/2308.10908 (Preprint).
3. Fares Alharbi, **Gautam Siddharth Kashyap***, and Budoor Allehyani, *Automated Ruleset Generation for HTTPS Everywhere: Challenges, Implementation, and Insights*, International Journal of Information Security and Privacy (IGI Global), 2024. http://doi.org/10.4018/IJISP.347330
4. Fares Alharbi, and **Gautam Siddharth Kashyap***, *Empowering Network Security through Advanced Analysis of Malware Samples: Leveraging System Metrics and Network Log Data for Informed Decision-Making*, International Journal of Networked and Distributed Computing (Springer), 2024. https://doi.org/10.1007/s44227-024-00032-1

SCOPUS-Indexed

1. Malvika Kanojia, Prerna Kamani, **Gautam Siddharth Kashyap***, Shafaq Naz, Samar Wazir, and Abhishek Chauhan, *Alternative Agriculture Land-Use Transformation Pathways by Partial-Equilibrium Agricultural Sector Model: A Mathematical Approach*, International Journal of Information Technology (Springer), 2024. https://doi.org/10.1007/s41870-024-02158-5
2. Shafaq Naz, and **Gautam Siddharth Kashyap***, *Enhancing the Predictive Capability of a Mathematical Model for Pseudomonas Aeruginosa through Artificial Neural Networks*, International Journal of Information Technology (Springer), 2024. https://doi.org/10.1007/s41870-023-01721-w
3. Nirmal Marwah, Vivek Kumar Singh, **Gautam Siddharth Kashyap***, and Samar Wazir, *An analysis of the robustness of UAV agriculture field coverage using multi-agent reinforcement learning*, International Journal of Information Technology (Springer), 2023. https://doi.org/10.1007/s41870-023-01264-0

Book Chapters

1. **Gautam Siddharth Kashyap***, Karan Malik, Samar Wazir, and Alexender E.I. Brownlee, *Vehicle routing optimization for supply chain management system solved using the RWPSO approach*, Optimization and Data Science in Supply Chain and Logistics: Towards Operational and Business Excellence (Volume 2) (Springer), 2024 (Under Review). Available at https://arxiv.org/abs/2306.02308 (Preprint).
2. **Gautam Siddharth Kashyap***, Jatin Sohlot, Ayesha Siddiqui, Ramsha Siddiqui, Karan Malik, Samar Wazir, and Alexender E.I. Brownlee, *Detection of facemask using deep learning methods: prevention of covid-19,* Research Advances in Network Technologies (Volume 2) (CRC Press Taylor and Francis), 2024. https://doi.org/10.1201/9781003433958-11
3. **Gautam Siddharth Kashyap***, Ayesha Siddiqui, Ramsha Siddiqui, Karan Malik, Samar Wazir, and Alexender E.I. Brownlee, *Prediction of suicidal risk using machine learning models*, Research Advances in Intelligent Computing (Volume 2) (CRC Press Taylor and Francis), 2024. https://doi.org/10.1201/9781003433941-11
4. **Gautam Siddharth Kashyap***, Prerna Kamani, Malvika Kanojia, Samar Wazir, Karan Malik, Vinay Kumar Sehgal, and Rajkumar Dhakar, Revolutionizing Agriculture: A Comprehensive Review of Artificial Intelligence Techniques in Farming, Research Advances in Intelligent Computing (Volume 2) (CRC Press Taylor and Francis), 2024. https://doi.org/10.1201/9781003433941-6
5. Samar Wazir, **Gautam Siddharth Kashyap***, Karan Malik, and Alexender E.I. Brownlee, *Predicting the Infection level of Covid-19 Virus Using Normal Distribution Based Approximation Model*, Mathematical Modelling and Intelligent Control for Combating Pandemics (Springer), 2023. https://doi.org/10.1007/978-3-031-33183-1_5
6. Honey Habib, **Gautam Siddharth Kashyap**, Nazia Tabassum, and Md Tabrez Nafis, *Stock Price Prediction using Artificial Intelligence based LSTM-Deep Learning Model,* Artificial Intelligence and Blockchain in Cyber Physical Systems (CRC Press Taylor and Francis), 2023. https://doi.org/10.1201/9781003190301-6

Peer Reviewed Conferences

1. Liyun Gong, Miao Yu, **Gautam Siddharth Kashyap**, Sheldon Mccall, James Brown and Xujiong Ye, *Innovate Spatial-Temporal Attention Network (STAN) for Accurate 3D Mice Pose Estimation with a Single Monocular RGB Camera*, EUSIPCO (IEEE), 2024, Lyon, France. **(Core Rank B)**. https://eurasip.org/Proceedings/Eusipco/Eusipco2024/pdfs/0000616.pdf
2. Orchid Chetia Phukan**, Gautam Siddharth Kashyap**, Arun Balaji Buduru and Rajesh Sharma, *Are Paralinguistic Representations all that is needed for Speech Emotion Recognition?*, Interspeech, 2024, Kos Island, Greece **(Core Rank A)**. https://doi.org/10.21437/interspeech.2024-2233
3. Orchid Chetia Phukan**, Gautam Siddharth Kashyap**, Arun Balaji Buduru and Rajesh Sharma, *Exploring Multilingual Pre-Trained Model Embeddings for Audio Deepfake*, NAACL Findings, 2024, Mexico City, Mexico. **(Core Rank A)**. https://doi.org/10.18653/v1/2024.findings-naacl.160

Reviewer

1. Journal of Big Data (Springer, SCI Indexed, IF = 10.835)
2. Complex & Intelligent Systems (Springer, SCI Indexed, IF = 6.700)
3. International Journal of Machine Learning and Cybernatics (Springer, SCI Indexed, IF = 6.400)
4. BMC Medical Informatics and Decision Making (Springer, SCI Indexed, IF = 3.500)
5. International Journal of Information Security (Springer, SCI Indexed, IF = 3.200)

6. The Journal of Supercomputing (Springer, SCI Indexed, IF =2.557)
7. Intelligent Systems with Applications (Elsevier, Scopus Indexed)

Skills

Programming Skills: C, C++, Python, HTML, CSS, PHP.
Technical Skills: Machine Learning, Data Science, Deep Learning, Data Structures.
Tools and Technologies: Google Colab, Jupyter Notebook, Github, Microsoft Offices.

Certification

1. Coursera Certificate – Neural Networks and Deep Learning (June 2023).
2. Coursera Certificate - Supervised Machine Learning: Regression and Classification (May 2023).
3. Coursera Certificate - Programming for Everybody (University of Michigan) (May 2023).
4. Coursera Certificate - Python Data Structures (University of Michigan) (May 2023).
5. Coursera Certificate - Using Databases with Python (University of Michigan) (May 2023).
6. Coursera Certificate - Using Python to Access Web Data (University of Michigan) (May 2023).
7. Coursera Certificate - Capstone: Reteieving Processing and Visualizing Data with Python (May 2023).
8. Certificate for the Completion of Python Training, Spoken Tutorial IIT Bombay, New Delhi, India (February 2022).
9. Certificate of Participation for C and CPP, Spoken Tutorial IIT Bombay, New Delhi, India (March 2019).
10. Training Certificate in English for Employability, British Council, New Delhi, India (Spring 2018).
11. PHP Workshop Certificate, APTRON, New Delhi, India (October 2018).

Honours/Awards

1. Certificate of Participation in International Equanimity Olympiad – 2015.
2. Smart Kid General Knowledge Olympiad – 2011 (State Rank -212, All India Rank 1393).
3. Bronze Medal (Academics) – Delhi English Academy School, New Delhi, India – 2009.
4. Certificate of Participation in Painting Competition – 2008, 2009.
5. Silver Medal (Sports)- Greenway Modern School, New Delhi, India – 2005.

Research Interests

1. Real-World Optimization Problems.
2. Metaheuristics Approaches such as PSO.
3. AI-Machine Learning/Deep Learning in Agriculture, Healthcare and Medical related fields.
4. Explainable AI.
5. Usable Security.

Details of Referee

Referee 1:

Name: Dr Md Tabrez Nafis (Associate Professor)
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Referee 3:

Name: Dr Alexander E. I. Brownlee (Senior Lecturer)
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Referee 4:

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Referee 5:

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Referee 6:

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Organization Address: Microsoft Inc, Texas, USA