RITAM GUHA

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ACADEMIC QUALIFICATION

Bachelor of Engineering (Computer Science and Engineering), Jadavpur University, Kolkata, CGPA -9.2/10

ACADEMIC PROJECTS

Title: Coalition-game based Genetic Algorithm to Perform Dimension Reduction of Human Activity Recognition Datasets
Location: Jadavpur University, Kolkata
Duration: July 2019 – Present
Team size: 3
Objective: To use coalition-game in GA to find a highly informative feature subset from HAR features
Individual Role: Introduced a coalition-game and Shapley value-dependent fitness function which in turn guided the selection of important features and modified the mutation function of GA

Title: Introduction of a Pearson Correlation Coefficient and Mutual Information Dependent Feature Ranking Technique
Location: Jadavpur University, Kolkata
Duration: July 2019 – Present
Team size: 3
Objective: To develop a new feature ranking technique combining the statistical interpretations of PCC and MI
Individual Role: Proposed a new feature-ranking criterion which use feature-feature correlation (through PCC value) as well as feature-class correlation (through MI value)

Title: Image Contrast Enhancement using Nature-inspired Optimization Algorithms and Entropy-based Fitness Values
Location: Jadavpur University, Kolkata
Duration: July 2019 – Present
Team size: 4
Objective: To implement nature-inspired optimization techniques like PSO, GA, ASO, etc. for finding optimal pixel intensity values using entropy-based fitness evaluation of candidate solutions
Individual Role: Modified the fitness evaluation by introducing four separate terms namely edge count, edge intensity, entropy and dissimilarity measures

Title: A Hybrid Swarm and Gravitation Based Feature Selection Algorithm for Handwritten Indic Script Classification Problem
Location: Jadavpur University, Kolkata
Duration: May – August 2019
Team size: 4
Objective: To reduce of Automatic Script Identification (ASI) datasets using an effective hybridization of PSO and GSA
Individual Role: Developed a model which used PSO's local searching capabilities to overcome GSA's low exploitation ability which was applied to Indian script-based features like DHT, HOG, MLG, etc.

Title: Embedded Chaotic Whale Survival Algorithm for Filter-Wrapper Feature Selection
Location: Jadavpur University, Kolkata
Duration: March – May 2019
Team size: 5
Objective: To introduce an embedded version of the popular wrapper model known as Whale Optimization Algorithm (WOA)
Individual Role: Developed ECWSA which is an embedded version of WOA

Title: A New Multi-Objective Feature Selection Algorithm for Handwritten Numeral Classification
Location: Jadavpur University, Kolkata
Duration: January – February 2019
Team size: 5
Objective: To apply an updated version of HMOGA for feature selection on handwritten Devanagari numeral recognition datasets

Individual Role: Added memory to keep track of the feature vectors which eventually get lost in HMOGA

Title: A Wrapper-Filter Feature Selection Technique based on Ant Colony Optimization
Location: Jadavpur University, Kolkata
Duration: August – November 2018
Team size: 4
Objective: Modify Ant Colony Optimization (ACO) for improved feature selection (FS)
Individual Role: Introduced a filter-based subset evaluation to reduce the computation complexity of the wrapper model known as ACO

Title: Introducing Clustering-based Population in Binary Gravitational Search Algorithm for Feature Selection
Location: Jadavpur University, Kolkata
Duration: June – October 2018
Team size: 5
Objective: To solve the problem of premature convergence of GSA which affects exploration leading to performance degradation
Individual Role: Used a clustering technique in order to make the initial population distributed over the entire feature space and to increase the inclusion of more promising features which resulted in an improved exploration

Title: Great Deluge based Genetic Algorithm for feature selection
Location: Jadavpur University, Kolkata
Duration: May – July 2018
Team size: 6
Objective: To increase local search capabilities of Genetic Algorithm (GA)
Individual Role: Replaced the mutation operation in GA with the Great Deluge Algorithm (GDA) to increase its exploitation

Title: Binary Genetic Swarm Optimization: a Genetic Algorithm and Particle Swarm Optimization Hybrid for Feature Selection
Location: Jadavpur University, Kolkata
Duration: May – July 2018
Team size: 6
Objective: To combine the candidate solutions generated by GA and PSO in an effective way
Individual Role: Combined the results of GA and PSO by an algorithm called Average Weighted Combination Method (AWCM) followed by further refinement through a local search technique called Sequential One-Point Flipping (SOPF) to achieve a better result

PAPER PRESENTATIONS

- Presented a paper titled 'Contrast Enhancement of Degraded Document Image using partitioning based Genetic Algorithm' at Government College of Engineering and Leather Technology, Kolkata, West Bengal, February 2019
- Presented a paper titled 'Feature Selection using Histogram based Multi-Objective Genetic Algorithm for Handwritten Devanagari Numeral Recognition' at Kalinga Institute of Industrial Technology, Bhubaneswar, Odisha, India, October 2017

PUBLICATIONS

- Ghosh, Manosij, **Ritam Guha**, Ram Sarkar, and Ajith Abraham. 'A wrapper-filter feature selection technique based on ant colony optimization' Neural Computing and Applications, 1-19
  Journal Name: Neural Computing and Applications, Springer (2019 Impact Factor: 4.664), 11 April 2019
- **Guha, Ritam**, Manosij Ghosh, Souvik Kapri, Sushant Shaw, Shyok Mutsuddi, Vikrant Bhateja, and Ram Sarkar 'Deluge based Genetic Algorithm for feature selection' Evolutionary Intelligence (2019): 1-11
  Journal Name: Evolutionary Intelligence, Springer, 07 March 2019
- **Guha, Ritam**, Manosij Ghosh, Pawan Kumar Singh, Ram Sarkar, and Mita Nasipuri. 'M-HMOGA: A New Multi-Objective Feature Selection Algorithm for Handwritten Numeral Classification' Journal of Intelligent Systems.
  Journal Name: Journal of Intelligent Systems, De Gruyter (2018 SNIP: 0.533, 2018 Cite Score: 1.03), 14 June 2019
- Ghosh, Manosij, **Ritam Guha**, Riktim Mondal, Pawan Kumar Singh, Ram Sarkar, and Mita Nasipuri. "Feature selection using histogram-based multi-objective GA for handwritten Devanagari numeral recognition." In Intelligent Engineering Informatics, pp. 471-479. Springer, Singapore, 2018
  Journal Name: Intelligent Engineering Informatics, Springer, 11 April 2018

- Ghosh, Manosij, **Ritam Guha**, Pawan Kumar Singh, Vikrant Bhateja, and Ram Sarkar. "A histogram-based fuzzy ensemble technique for feature selection." Evolutionary Intelligence (2019): 1-12.
  Journal Name: Evolutionary Intelligence, Springer, 27 August 2019
- Ghosh, Manosij, **Ritam Guha**, Imran Alam, et al. 2019. Binary Genetic Swarm Optimization: A Combination of GA and PSO for Feature Selection. *Journal of Intelligent Systems*. 0(0): -. Retrieved 17 Sep. 2019, from doi:10.1515/jisys-2019-0062
  Journal Name: Journal of Intelligent Systems, De Gruyter, 17 September 2019
- **Guha, R**., Ghosh, M., Chakrabarti, A., Sarkar, R., & Mirjalili, S. (2020). Introducing clustering-based population in Binary Gravitational Search Algorithm for Feature Selection. *Applied Soft Computing* (2019 Impact Factor: 4.873), 106341.
- **Preprints-** 1) https://arxiv.org/abs/2005.04593 (Embedded chaotic whale survival algorithm)
  2) https://arxiv.org/abs/2005.04596 (Hybrid Swarm and Gravitation based algorithm)
  3) https://arxiv.org/abs/2005.04599 (Fuzzy mutation embedded hybrid GSA and PSO)
  4) https://www.researchsquare.com/article/rs-28684/v1 (Binary Manta Ray Foraging algorithm)
  5) https://www.researchsquare.com/article/rs-28683/v1 (Binary Equilibrium Optimization with Simulated Annealing)
  6) https://www.researchsquare.com/article/rs-28679/v1 (Novel Groundwater Flow Algorithm)
  7) https://www.researchsquare.com/article/rs-28157/v1 (Coalition game-based Genetic Algorithm)

TECHNICAL SKILLS

- Programming Language: C, C++, MATLAB, Java, Python (beginner).
- Operating System: Windows and Linux.
- Article writing tools: LaTeX, Word, Excel, PowerPoint.

INDUSTRIAL VISIT

Probe Information Services Pvt. Ltd., Bangalore, June – July 2019

- Worked as a part of the team responsible for automating the company workflow most of which was previously done manually
- Using Java Selenium framework, automated the process of web-scrapping trademark-registry information of every Indian company associated with the Ministry of Corporate Affairs
- Visited the company's data warehouse in Salem, Chennai which enhanced my knowledge about the company workflow and its implementation.

SCHOLASTIC ACHIEVEMENTS

- Currently holding the 2nd position in the Department of Computer Science and Engineering of Jadavpur University with an overall CGPA of 9.202 out of 10 (till 5th semester of the curriculum)
- Secured 1st rank in 4th semester with a CGPA of 9.63, Jadavpur University
- Ranked 68th in West Bengal Joint Entrance Examination among nearly 1.5 lakh students, WBJEE, 2016
- Secured 23rd rank in the National Cyber Olympiad in West Bengal, Andaman & Nicobar Zone in class 12
- In 12thstandard board examination, secured 7th position in the state of West Bengal
- In 10thstandard board examination, secured 1st position in school and 12th position in the state level
- At 6th standard, received INSPIRE award from Government of India, Ministry of Science & Technology for best performance in the school in science group

EXTRACURRICULAR ACTIVITIES

- Member of IEEE student sector since August 2019
- Participated in college fresher inter-departmental robotics competition 'JontroTontro'and built a parent following bot which always tracked a yellow circle attached to the back-end of the parent bot and followed it (organized by Mechanical Engineering department of Jadavpur University in February 2016)
- Participated in many competitive coding contests hosted by some popular platforms like Codechef, Hackerrank, etc. Codechef Monthly challenge, lunchtime, cook-off and Hackerrank week of code, HourRank, 101 Hack are to name a few competitions in which I have participated during 2017-18.
- Mentored two groups of juniors to complete two different projects on feature selection in my third year (2018)