

BHISHAM DEV VERMA

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RESEARCH INTEREST

My research interest includes sketching algorithms, data mining, machine learning, optimization, and soft computing.

EDUCATION

Indian Institute of Technology Mandi Ph.D. Scholar	<i>Feb-2019 - Present</i> CGPA: 9.38/10
Indian Institute of Technology Mandi Master of Science in Applied Mathematics	<i>August 2016 - 2018</i> CGPA: 8.8/10
Himachal Pradesh University Bachelor of Science	<i>August 2012 - 2015</i> Percentage: 63.75%

PUBLICATIONS

- **Improving Sign-Random-Projection via Count Sketch.** Punit Pankaj Dubey, **Bhisham Dev Verma**, Rameshwar Pratap, Keegan Kang. *Accepted in the 38th Conference on Uncertainty in Artificial Intelligence (UAI), 2022 (Core A*)*.
- **Variance reduction in Feature Hashing using MLE and Control Variate Method.** **Bhisham Dev Verma**, Rameshwar Pratap and Manoj Thakur. *Machine Learning (2022): 1-32*.
- **Efficient Binary Embedding of Categorical Data using BinSketch.** **Bhisham Dev Verma**, Rameshwar Pratap and Debajyoti Bera. *Data Mining and Knowledge Discovery (2022): 1-29*.
- **Dimensionality Reduction for Categorical Data.** Debajyoti Bera, Rameshwar Pratap, and **Bhisham Dev Verma**. *IEEE Transactions on Knowledge and Data Engineering*, 2021.
- **QUINT: Node embedding using network hashing.** Debajyoti Bera, Rameshwar Pratap, **Bhisham Dev Verma**, Biswadeep Sen, and Tanmoy Chakraborty. *IEEE Transactions on Knowledge and Data Engineering*, 2021.
- **Improving Tug-of-War sketch using Control-Variates method.** Rameshwar Pratap, **Bhisham Dev Verma** and Raghav Kulkarni. In *SIAM Conference on Applied and Computational Discrete Algorithms (ACDA21): 66-76*.
- **Parallel multi-agent real-coded genetic algorithm for large-scale black-box single-objective optimisation.** Andranik S Akopov, Levon A Beklaryan, Manoj Thakur, **Bhisham Dev Verma**. *Knowledge-Based Systems* 174 (2019): 103-122.

PROJECTS

Practical Portfolio Optimization using Heuristic Techniques

August 2017 - June 2018

Advisor: Dr. Manoj Thakur, Associate Professor, SBS, IIT Mandi

Master's Thesis

- Modified NSGA-2 algorithm for Practical Portfolio problem and implemented that algorithm to solve Portfolio Optimization problems in C/C++.

Portfolio Optimization using Differential Evolution

Winter Intern-2017

Advisor: Dr. Manoj Thakur, Associate Professor, SBS, IIT Mandi

- Studied and Implemented Differential Evolution algorithm to solve Portfolio Optimization problems in C/C++.

Implementation of Transportation Problem in C/C++

Summer Intern-2017

Advisor: Dr. Manoj Thakur, Associate Professor, SBS, IIT Mandi

- A code package for solving transportation problem is built. Implemented Northwest corner rule, Least Cost method, Vogel's approximation method to get feasible solution followed by MODI method to get optimal solution in C/C++.
- The output is a \LaTeX code which on compilation gives a stepwise solution.

Implementation of Classifiers in Python

Spring - 2017

Pattern Recognition, Instructor: Dr. Dileep A.D., Assistant Professor, SCEE, IIT Mandi

- Bayes Classifier using GMM, K-nearest neighbor method for class-conditional density estimation using DTW distance, Discrete HMM in Python 3.
- Fisher linear Discriminant Analysis (FDA), Perceptron Based Classifier, SVM based Classifier using linear kernel, Polynomial kernel and Gaussian Kernel in Python 3.

Eigenfaces for Face Detection

Spring - 2017

Matrix Theory, Instructor: Dr. Siddhartha Sarma, Assistant Professor, SCEE, IIT Mandi

- Computed Eigenfaces using PCA for face detection in Python 3.

TECHNICAL STRENGTHS

Computer Languages

C/C++, PYTHON, MATLAB

Software & Tools

\LaTeX , MS-Office

WORKSHOP & SUMMER SCHOOLS

- Attended Research Week with Google organised by Google Research India, Feb 8-11, 2022.
- Attended Google Research India Graduate Symposium, April 7-9, 2021.
- IFCAM Summer School Workshop 2019 on Mathematics For Data Science, IISc Bangalore.
- IEEE CIS Summer School Workshop on Computational Intelligence : Tools and Techniques for Smart Grid Solutions, IIT Delhi-2017.
- Summer Program in Mathematics-2017, HRI-Allahabad.

RELEVANT COURSES

Applied Mathematical Programming
Optimization Techniques
Pattern Recognition
Probability & Statistics
Programming Practicum
Probability and Random Process

Linear Algebra
Heuristic Optimization
Matrix Theory
Numerical Analysis
Soft Computing

ACHIEVEMENTS

- Awarded Best Teaching Assistant Award - 2021 by Indian Institute of Technology Mandi in recognition of contribution in the preparation of assignments and clearing doubts of the students in the Data Science 1 course.
- Outstanding Academic Achievement Award for academic excellence among the graduating batch of MSc Applied Mathematics students in the year 2018.
- GATE-2018 - Mathematics.
- IIT-JAM 2016 - Mathematics.

REFERENCES

Dr. Manoj Thakur

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Dr. Rameshwar Pratap

Assistant Professor
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