PROTEEK CHANDAN ROY

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OBJECTIVE

I am a final year PhD student working in the intersection of optimization, machine learning and algorithm with contributions in privacy-preserving machine learning, deep multi-task learning, and multi-objective large scale constrained optimization. I have publications in leading CS conferences (including CVPR, COLING, GECCO, IEEE CEC, EMO & IEEE SSCI) and top journals (IEEE TEVC & IEEE TCYB). I am seeking for a research oriented full-time position/postdoc in the field of machine learning/data science/optimization/algorithm engineering from August 2019.

EDUCATION

Michigan State University *August 2015 - expected Aug 2019*
PhD in Computer Science (**Advisor: Dr. Kalyanmoy Deb**)
CGPA: 3.92/4.00

Mississippi State University *August 2015*
MS in Computer Science, (**Advisor: Dr. Eric A. Hansen**)
CGPA: 3.72/4.00

Bangladesh University of Engineering and Technology *February 2011*
BS in Computer Science and Engineering, CGPA: 3.71/4.00
Major CGPA: 3.82, Merit Position: 29^{th} out of 138

WORK EXPERIENCE

Developer May 2013 - August 2013
Google Summer of Code

- An open source project for strategy or policy generation functionality for *PRISM Model Checker* with **Dr. David Parker** (University of Birmingham). Java is used as language.

Quantitative Software Developer May 2011 - July 2012
Stochastic Logic Limited, ACI, Dhaka

- Statistical modeling and analysis, financial data analysis, time series analysis for one of the largest Bangladeshi conglomerates. MATLAB is used for development.

CURRENT PROJECTS

- Privacy-preserving machine learning for domain-invariant/fair image classification/generation
- Efficient multi-task learning (trade-off front generation) for deep neural network.
- Adaptive switching method for metamodeling frameworks for expensive multi-objective optimization problems Part-I & Part-II (under review *IEEE TEVC*)

COMPUTER SKILL

Professional

Computer Languages	**Python, MATLAB**, Java
Application Softwares, Tools & APIs	**Pytorch**, Tensorflow, scikit-learn

Basic

Computer Languages	**C, C++**, PhP, SQL, LISP, Assembly, C#, ASP .NET, SAS, R

SELECTED RESEARCH PUBLICATIONS

JOURNAL

- "A Taxonomy for Metamodeling Frameworks for Evolutionary Multi-Objective Optimization", *IEEE Transaction on Evolutionary Computation (**Impact Factor: 8.124**)*, 2018, by Kalyanmoy Deb, R. Hussein, **Proteek Roy**, Gregorio Toscano. (popular in downloads in April, 2018).
- "An Efficient Non-dominated Sorting Algorithm for Large Number of Fronts", *IEEE Transactions on Cybernetics (**IF: 8.803**)*, 2018, by **Proteek Roy**, K. Deb, M. Islam.
- "Evolutionary Path Control Strategy for Solving Many-Objective Optimization Problem", *IEEE Transactions on Cybernetics*, 2015, **Proteek Roy**, Md. M. Islam, K. Murase, X. Yao
- "A multi-objective approach to water and nutrient efficiency for sustainable agricultural intensification", *Agricultural Systems*, 2019, Ian Kropp, A Pouyan Nejadhashemi, Kalyanmoy Deb, Mohammad Abouali, **Proteek Roy**, Umesh Adhikari, Gerrit Hoogenboom

CONFERENCE

- **CVPR 2019:** "Mitigating Information Leakage in Image Representations: A Maximum Entropy Approach" - **Proteek Roy** and Vishnu Boddeti **(accepted as oral presentation, top 6% out of 5160 submissions)**
- **EMO 2019:**
  - "Trust-Region Based Multi-Objective Optimization for Low Budget Scenarios"- **Proteek Roy**, R. Hussein, J. Blank and K. Deb **(Best paper nomination)**
  - "Simulation Optimization of Water Usage and Crop Yield Using Precision Irrigation"- **Proteek Roy**, A. Guber, M. Abouali, A. P. Nejadhashemi, K. Deb, A. J. M. Smucker **(Best Poster Award)**
  - "Investigating the Normalization Procedure of NSGA-III"- J. Blank, K. Deb, **Proteek Roy**
- **COLING 2018:** "Multi-Source Multi-Class Fake News Detection", , by Hamid Karimi, **Proteek Roy**, Sari Saba-Sadiya, Jiliang Tang
- **IEEE SSCI 2018:** "Switching Between Metamodeling Frameworks for Efficient Multi-Objective Optimization", R.Hussein, Proteek Roy, K. Deb
- **GECCO 2017:** "Metamodeling for multimodal selection functions in evolutionary multi-objective optimization"- **Proteek Roy**, R. Hussein, K. Deb
- **EMO 2017:** "Classifying Metamodeling Methods for Evolutionary Multi-objective Optimization: First Results"- K. Deb, R. Hussein, **Proteek Roy**, and G. Toscano
- **IEEE CEC 2016:** "High-dimensional Model Representation for solving Expensive Multi-objective Optimization Problems"-**Proteek Roy** and K. Deb
- **GECCO 2016:** "Best order sort: A New Algorithm to Non-dominated Sorting for Evolutionary Multi-objective Optimization"- **Proteek Roy**, M. Islam, and K. Deb
- **IEEE ISCI 2011:**- "A-Class: Intelligent Classroom Software for the Autistic Children", Md. R. Rahman, S. Naha, **Proteek Roy**, I. Ahmed, S. Samrose, Md. M. Rahman, S. I. Ahmed

RESEARCH EXPERIENCE

Graduate Research Assistant August 2015 - Present
Michigan State University

- Proposed a privacy-preserving **deep learning** technique to maximize entropy instead of minimizing likelihood of an adversarial network attempting to predict sensitive attributes. This project uses Pytorch.
- Simulation optimization of precision irrigation with HYDRUS-2D and DSSAT software. MATLAB and Java used for research.
- Research and development of a metamodeling framework for solving computationally **expensive** multi-objective constrained and unconstrained optimization problems. We proposed
  - A comprehensive taxonomy (for the first time) of different possibilities of metamodeling
  - An ensemble based framework for switching among those techniques using trust region
  - Published **open source** MATLAB and Python codes for future research and development
- Fast non-dominated sorting algorithm for solving **large scale** multi-objective problems. Published **open source** java code. Proposed method became **state-of-the-art**. See at `https://github.com/mbuzdalov/non-dominated-sorting.wiki.git`

TEACHING EXPERIENCE

Graduate Teaching Assistant August 2012 - May 2015
Mississippi State University

- Lab manager and grader of Computer Networks, Database, Data Structure and Algorithms

ORGANIZATION

Program Committee
Evolutionary Multi-Criterion Optimization 2019, GECCO 2018-2019 (EMO Track)

Reviewer
IEEE Transaction on Evolutionary Computation, and Cybernetics, Evolutionary Computation (EC), Swarm and EC, GECCO 2018-2019, EMO 2019, 2018 IEEE Big Data conference (external)

Guest Speaker
National Systems Conference on Super Intelligent Machines and Man, 2017

HONORS/AWARDS

Graduate Research & Teaching Assistantship, Michigan State University (MSU) & Mississippi State University; Graduate Fellowship, MSU; COGS conference award, MSU; CVPR'2019 volunteer award

GRADUATE COURSES

Artificial Intelligence, Machine Learning, Deep Learning, Advanced Machine Learning, Advanced Computer Networks, Markov Decision Process, Algorithms

RESEARCH AND DEVELOPMENT INTEREST

Privacy-preserving deep learning, Deep multi-task learning, Expensive or simulation based multi-objective optimization and metamodeling, Combinatorial and large scale optimization

REFERENCES

Available upon request.