Kalyan Roy

Personal Information

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Google Scholar | https://roy-kalyan.github.io

Education

BS in *Computer Science and Engineering* at **North South University**, Dhaka, Bangladesh
August, 2014 - December, 2019

Notable Courses : Data Structures and Algorithms, Design and Analysis of Algorithms, Artificial Intelligence, Neural Networks

Work Experiences

- Research Assistant (RA) at **North South University**, Dhaka, Bangladesh
  November, 2018 - Present
  Supervisor : *Dr. Ahsanur Rahman*
  Research Area : Graph Theory, Data Mining
  Responsibilities : Implementing an exact algorithm to enumerate dense-subgraphs of a graph. Implementing an approximation algorithm to find minimal vertex cover. Testing algorithms with real and synthetic data.

- Teaching Assistant (TA) at **North South University**, Dhaka, Bangladesh
  January, 2019 - September, 2019
  Courses : Design and Analysis of Algorithms
  Data Structures and Algorithms
  Programming Language I
  Responsibilities : Holding regular office hours, tutoring sessions, scoring answer scripts and assignments.

Research Interests

Algorithms, Graph Theory, Data Mining

Publications

Journals

- **A Step towards Information Extraction : Named Entity Recognition in Bangla using Deep Learning**
  Redwanul Karim, M.A. Muhaiminul Islam, Sazid Rahman, Saif Ahmed Chowdhury, Kalyan Roy, Adnan Al Neon, Md. Sajid Hasan, Adnan Firoze, Rashedur M. Rahman LINK
  Publisher : IOS Press **DOI :** 10.3233/JIFS-179349

Conference Papers

- **Crime Prediction Using Multiple-ANFIS Architecture and Spatiotemporal Data**
  Mashnoon Islam, Redwanul Karim, Kalyan Roy, Sadat Hossain, Saif Mahmood, Rashedur M. Rahman LINK
  Publisher : IEEE Intelligent Systems IS'18 **DOI :** 10.1109/IS.2018.8710564

Current Research Projects

- **A Fast Algorithm to Enumerate Maximal Quasi-cliques in a Graph**
  Description : *This research falls under the area of graph theory. We are developing an exact algorithm, called QCE (stands for Quasi-Clique Enumerator) to enumerate dense portions (a.k.a., dense subgraphs or quasi-cliques) of a network (a.k.a., graphs). QCE is a reverse search algorithm along with effective pruning techniques employed from graph theory. Because of these pruning techniques, our algorithm runs significantly faster than our competitors as well as takes less or comparable amount of memory.*
  Tools and Frameworks : *C, C++, Python, Bash, NetworkX, Matplotlib, Seaborn, GNU parallel*
  October, 2018 - Present LINK

- **An Approximation Algorithm For Vertex-cover Problem**
  Description : *The goal is to design and implement an approximation algorithm to find the minimal or near minimal vertex-cover of a network (a.k.a., graphs). We are employing known theorems from graph theory as well as deriving new theorems for the research purpose.*
  Tools and Frameworks : *C, C++, Python, Bash, NetworkX*
  June, 2020 - Present LINK

Academic Projects

- **Bangla Automatic License Plate Recognition (ALPR) System**
  Description : *In this project, we collaborated with a company named Headblocks. We built a system that recognizes multiple vehicles license plates at a time. It works even if the taken videos of license plates are skewed, faded and blurry and taken at night or in low light with high accuracy.*
  Tools and Frameworks : *Python, PyTorch, OpenCV*
  January, 2019 - September, 2019

- **A Unified Platform for Face Recognition - Deep Learning and Conventional Approach**
  Description : *In this project, we built a unified platform for face recognition, in which deep learning and conventional models were integrated i.e., YOLOv2, Haar feature-based cascade classifier. Using this platform we can compare the performance of different face recognition models.*
  Tools and Frameworks : *Python, TensorFlow, OpenCV*
  January, 2018 - April, 2018

Skills

Programming Languages	: C, C++, Python, R, Java, Bash
Version Control	: GIT
Database Tools	: MySQL
Open Source Tools	: Vim, Tmux, Valgrind, GNU profiler (gprof), GNU parallel

Awards and Participation

Participated in ICPC Dhaka Regional Site 2019 *LINK*
Participated in ICPC Dhaka Regional Site 2018 *LINK*
Participated in Bangladesh Mathematical Olympiad National Site 2012