Teacher	Topics	Details	No. of Std
Abu Wasif (wasif)	Abstraction, Reformulation, and Approximation (ARA)	Abstraction, Reformulation, and Approximation (ARA) are central to human reasoning and problem solving. It is an active area of Artificial Intelligece (AI) research. The student is expected to perform an empirical study on techniques for automatically constructing and selecting appropriate abstractions, reformulations, and approximations. In particular, we are going to study the reformulation of a problem or task to a new or different problem or task in the context of application of problem-specific heuristics.	2
Abu Wasif (wasif)	Meta-reasoning and Search	Heuristic search and combinatorial optimization are current active areas of research in Artificial Intelligence, Robotics, Planning and other areas of Computer Science. In particular, search is an important field of Artificial Intelligence. The student is expected to do a study on meta-reasoning and search. The capacity to think about our own thinking is what makes human beings intelligent. Researchers in artificial intelligence are making attempts to implement programs that simulate this capacity, called meta-reasoning. Rational meta-reasoning algorithms for problem solving search is able to make a choice of appropriate search heuristics for different problem domains. For this thesis, the empirical evaluations on costs and benefits of employing meta-reasoning for the general problem solving search will be performed.	2
Abu Wasif (wasif)	Image analysis and scene understanding	Image analysis and scene understanding are active research areas of computer vision, pattern recognition and signal processing. The task of scene understanding require an in-depth understanding and balancing between local, global and dynamic aspects which can occur within a scene. For this thesis, the student is expected to study methods that are capable of representing a scene at different level of semantic granularity and modeling various degrees of interactions between objects, human characters and space. In particular, we are going to apply the techniques for understanding cartoons or animation pictures.	2
Dr. A. B. M. Alim Al Islam (razi)	Optimization of on-road experience through devising new policies and arrangements	Traffic jam is one of the major problems in third-world countries, specifically in Bangladesh. In this thesis, our aim will be to come up with new policies and arrangements to lessen extent of the traffic jam. The thesis needs to be performed through focusing on theory, simulation, and hardware implementation if needed.	1
Dr. A. B. M. Alim Al Islam (razi)	Towards making a credible and effective online reporting system	A credible and effective online reporting system is of utmost significance for general people as they are yet to get a platform for sharing their experiences with others in a secured and anonymous manner. Developing such a platform needs focusing on different stakeholders (reporter, accused personnel, higher authorities, general people, etc.) along with technological barriers. This thesis is aimed at focusing on all these issues. An initiation of the work could be through addressing a problem (for example ragging) existing in BUET through the reporting system.	1

Dr. A. B. M. Alim Al Islam (razi)	Greening parallel computing	Parallel computing is of great interest in recent times. A contemporary example of this could be data centers. In general, a huge amount of power is required for operating a parallel computing infrastructure. Our goal would be to minimizing the power consumption here. Several solutions exist for this problem. Our goal will be to devise a solution that can go beyond those solutions. Besides, we will attempt to focus on the perspectives that are prevailing in the context of Bangladesh while devising our solution.	1
Dr. A. B. M. Alim Al Islam (razi)	Nanonetworking	Nanonetworks has become promising for various applications such as nano drug, bio weapons, industrial production, etc. In this thesis, our goal will be to investigate different aspects of communication over nanonetworks. The investigation needs to perform simulation along with real implementation if needed.	1
Dr. A. B. M. Alim Al Islam (razi)	Biological data mining for sustaining adverse conditions	Human cannot live in water even though fish can. What biological aspects make this difference? Can we overcome it? In this thesis, similar studies exploring biological data (mostly focusing on genomic data) will need to be carried out to devise solutions to sustain in adverse conditions that are not adverse by some other species.	1
Dr. A. B. M. Alim Al Islam (razi)	Overcoming wireless sensor network's topological and deployment challenges in Bangladesh	It is extremely difficult to effectively plan topology and deployment of sensor nodes of a WSN (for example intended for environmental monitoring or railway track monitoring) in Bangladesh. This thesis is expected to conduct study to overcome the barriers exist in such cases and enable real deployment of sensor nodes to collect real sensed data.	1
Dr. A.K.M. Ashikur Rahman (ashikurrahman)	On hetergeneous coverage in visual sensor networks.	This topic is a variation of the classical Min-Max problem which is known to be NP-hard. In a visual sensor network (VSN) there exist a number of self-configurable visual sensors with adjustable spherical sectors of limited angle that are meant to cover a number of targets. Imagine a heterogeneous scenario where all targets are not equally important, i.e., some targets are more prioritized over the others. Naturally the coverage problem in such scenarios also requires heterogeneous coverage. Thus, our goal in this thesis is to find a solution that covers maximum number of (heterogeneous) targets using minimum number of sensors.	3

Dr. A.K.M. Ashikur Rahman (ashikurrahman)	Food And Nutrition by Camera Image Analysis (FANCIA)	This is a collaborative research topic under HEQEP project (CP-3137) with Dr. Sheikh Iqbal Ahamed Professor and Director, Ubicomp Lab, Marquette University, USA. In this research, we propose an innovative technology to measure food and nutrient intake which is adaptable to the context of poor and rich people. This is a combination of active and passive imaging method that will overcome the limiting factors of the existing methodologies. For details, please visit the research topic at our project website below: http://cse.buet.ac.bd/heqep/public/index.php/projects/2	2
Dr. Abu Sayed Md. Latiful Hoque (asmlatifulhoque)	Big Data Analytics for Health	Preprocessing of Health Data, Storage and knowledge extraction	2
Dr. Abu Sayed Md. Latiful Hoque (asmlatifulhoque)	Classification Analysis of Diabatic Patient	Collection of diabetic patient data, preparation of training data, designing classifier and prediction of status for new patients	2
Dr. Abu Sayed Md. Latiful Hoque (asmlatifulhoque)	Information retrieval	Information retrieval using text database, similarity search and finding relevant documents	2
Dr. Anindya Iqbal (anindyaiqbal)	1.Analysing use of StackOverflow references during code review.	The idea of this project is to find out why and how developers use StackOverflow references during code review and which type of reviewers are more likely to use those. This would be a qualitative exploitative study. The task will require manual analysis and coding. This project will be in collaboration with Dr. Amiyangshu Basu from Uni. Southern Illinois, USA.	2
Dr. Anindya Iqbal (anindyaiqbal)	2.Enriching programming tutorials with insight from StackOverflow	The aim of this project would be to capture StackOverflow discussions on a particular language/framework and categorizing discussions with respect to their depth of quality. Next, the selected discussions would be added to enrich the quality of relevant tutorials. Dataset is available.	1
Dr. Anindya Iqbal (anindyaiqbal)	3.Automatic sentiment analysis of reader comments for Cricket or Football sites and analyzing their correlation with real world phenomena.	Analysing example research questions: Is a player's presence in media proportionate to his attraction in reader comments? Is a player's popularity among readers in line with his performance?	1
Dr. Anindya Iqbal (anindyaiqbal)	4.Identifying topics of interest and analyzing the text in the context of Bangladesh from social media data such as Twitter or Facebook.		1

Dr. Anindya Iqbal (anindyaiqbal)	5.Developing insight about the user and usage pattern from mobile accelerometer data. Dataset is available.		1
Dr. Atif Hasan Rahman (atif)	Genome assembly using third generation sequencing	Genome assembly is the process of merging 'reads' generated by sequencing technologies to construct the original genome. Third generation sequencing technologies including Pacific Biosciences and Oxford Nanopore can generate longer reads compared to earlier technologies at the expense of higher sequencing error rates. We will devise and implement methods to use third generation sequencing reads for scaffolding and other problems related to genome assembly. * For some background on genome assembly and sequencing technologies please see http://escholarship.org/uc/item/6hx4q2gm ** No prior knowledge of biology is necessary but will be helpful	3
Dr. Atif Hasan Rahman (atif)	Detecting and correcting structural errors in genome assembles	In the last decade the emergence of next-generation sequencing has led to assembly of genomes of many organisms. However, many of these assemblies have structural errors (insertions, deletions, inversions, copy number errors, etc.) in them making downstream genetic analysis difficult or inaccurate. In this project we will devise and implement methods to detect and correct structural errors. * For some background on genome assembly please see http://escholarship.org/uc/item/6hx4q2gm ** No prior knowledge of biology is necessary but will be helpful	2
Dr. M. Sohel Rahman (msrahman)	Algorithms in Bioinformatics	Developing Algorithms and tools for different problems in Bioinformatics and Computational Biology. Here, we can work on theoretical problems/algorithms as well as on practical problems/algorithms. For the latter, extensive experiments works must be conducted and hence you should be efficient in programming.	3
Dr. M. Sohel Rahman (msrahman)	Metaheuristic techniques to solve hard problems	We will apply metaheuristic techniques to solve real-life hard problems. Extensive experimentation would be necessary. Prior knowledge on metaheuristic rechniques are NOT essential.	3
Dr. M. Sohel Rahman (msrahman)	Problems involving Big Data	Here the goal is to devise novel algorithms and techniques to handle big data in a number of problem domains. We would like to work on domains like, Climate Change, Groundwater, Medical Informatics, bioinformatics etc.	3
Dr. Mahmuda Naznin (mahmudanaznin)	Web Analytics I	Algorithms for web data and architecture analysis. Machine learning knowledge is preferred. Students need to code and implement.	2
Dr. Mahmuda Naznin (mahmudanaznin)	Sensor and Mobile Data Analytics	Algorithms for sensor and mobile data analysis from the perspective of networks. Machine learning knowledge is preferred. Students need to code and implement algorithms.	2

Dr. Mahmuda Naznin (mahmudanaznin)	Node Deployment in Wireless Networks	Approximation algorithms design for node deployment in wireless networks. Algorithm engineering knowledge preferred. Students need to code or implement in designated platform. Platform can be decided after the discussion with the students.	1
Dr. Md. Abul Kashem Mia (kashem)	Algorithms for the Prediction of Protein Folding		3
Dr. Md. Abul Kashem Mia (kashem)	Algorithms for the Prediction of RNA Structures		2
Dr. Md. Monirul Islam (mmislam)	Bangla license plate recognition in hazardous conditions		2
Dr. Md. Monirul Islam (mmislam)	CCTV video image enhancement		2
Dr. Md. Monirul Islam (mmislam)	Bangla Visiting Card Reader for Smart Phones		2
Dr. Md. Monirul Islam (mmislam)	Locat Binary Pattern for Color Image Retrieval		2
Dr. Md. Monirul Islam (mmislam)	Locat Binary Pattern for Color Image Retrieval		2
Dr. Md. Saidur Rahman (saidurrahman)	Study of Contemporary Algorithms and Their Applications	Topics from Online Algorithms, Distributed Algorithms, Space-efficient algorithms, Graph Algorithms, Graph Drawing Algorithms, Complex Network Analysis, Graph Data Analytics with Applications, Social Network Analysis will be selected for assigned students. Applications of Algorithms in the area of VLSI design, Bioinformatics, Networks, Business might be studied. Thesis topics will be assigned to the students according to their interest and ability. Visit http://teacher.buet.ac.bd/saidurrahman/ https://cse.buet.ac.bd/research/group/gd http://cse.buet.ac.bd/faculty/facdetail.php?id=saidurrahman	5

Dr. Md. Shohrab Hossain (mshohrabhossain)	Attacks and Defense mechanisms for the control Plane in SDN	Software-defined networking (SDN) is an emerging network architecture that has gained much attention from academia and industry. The core idea of SDN is to decouple the network's control and data planes, interconnecting them with a standard protocol, i.e. OpenFlow. The centralized control plane makes network management simple and efficient, while the decoupled architecture allows the two planes to evolve separately, enabling rapid innovations in network management. However, SDN control plane fails to provide sufficient throughput. This vulnerability could be exploited by malicious agents to initiate DDoS attacks, causing network performance degradation and interruption. Traditional DDoS defense approaches focus on protecting the data plane, and are therefore ineffective in the cases of SDN control plane DDoS attacks.	1
Dr. Md. Shohrab Hossain (mshohrabhossain)	Mobile Malware analysis and detection techniques	A malware is a program which disrupts computer operation, gathers sensitive information or gains access to private systems without users consent. With the ever increasing use of mobile devices, mobile malware pose a significant threat because these devices store contacts, bank account numbers, credit/debit numbers, private photos, messages and a lot of other sensitive information that can be leaked. In this thesis, students will perform experiments to detect mobile malwares (from a subset of 1260 malwares, downloaded from Android Malware Genome Project). This is an ongoing research project under my supervision. The new student will join other members of the group to improve the performance of our proposed schemes and/or extend it. Knowledge of Android programming is mandatory for this thesis.	1
Dr. Md. Shohrab Hossain (mshohrabhossain)	Session Hijacking and its prevention techniques	Session Hijacking attack consists of the exploitation of the web session control mechanism, which is normally managed for a session token. The session token could be compromised in different ways: Predictable session token, Session Sniffing, SSL stripping, Client-side attacks (XSS, malicious JavaScript Codes, Trojans, etc), MITM attack, Man-in-the-browser attack. In this thesis, students will study the Session Hijacking attacks and propose techniques to mitigate those attacks. They will have to test the performance of their proposed solution through experimentation.	1

Dr. Md. Shohrab Hossain (mshohrabhossain)	Mobility models for ad hoc networks	In this thesis, the students will survey the existing mobility models for ad hoc networks: MANET, VANET, FANET. After analyzing the existing models and their limitations, they will propose at least two modified mobility models for VANET and FANET. The models will be tested through simulators and compared with existing other classical models.	1
Dr. Mohammad Mahfuzul Islam (mahfuz)	Steganography Schemes	Securing data using Cryptography is not worthy when the intruder has the intention to harm the data users. Steganogrpahy schemes hide data in images so that intruder cannot realize the presence of data. The research area has been emerge within the current decade. One of my PhD student is working in this area area and he is almost at the final stage of his degree.	2
Dr. Mohammad Mahfuzul Islam (mahfuz)	Security and Recommendation in Social Network	Social networks are now being used widely and many ill-motivated person are using this new technology for their personal benefits and making harm to others. People must be protected from the misdeeds of social networks through providing proper security. On the other hand, there are billions of items in the world and recommendation to the specific items may make significant progress in social network based business.	2
Dr. Mohammad Mahfuzul Islam (mahfuz)	Wireless sensor network	With the progress of technologies in IT Era, wireless sensors networks are being used in everywhere for monitoring different sectors including dust in water, temperature, humidity, and environment protection. Routing and Security is the key issue in this case. One of the PhD student is working in this area.	2
Dr. Mohammad Mahfuzul Islam (mahfuz)	Vehicular Communications	Internet of Things are now being emerged in establishing the communication between cars in roads and solve the traditional problems associated with it. Vehicular communication shall provide a smart world where all the vehicles will communicate with each other and establish a network for providing different types of services. One of the PhD student is working in this area.	2
Dr. Mohammed Eunus Ali (eunus)	Temporal Behavioral Analysis: An Approach Towards Identity Resolution	These days, people use multiple social media sites for different purposes. It is quite common for an online user to have multiple accounts in different networking, image sharing and micro-blogging sites. Through these accounts people leave their digital footprints over the web. Identifying a user's different accounts across the web has become an interesting research problem. Aggregating a user's information across different sites can have multiple domain applications. A user's comprehensive virtual profile can be used to predict his behaviour under different circumstances. This can be very helpful in providing better customer services. Insurance companies can leverage these data for better risk assessment and decision making across the policy lifecycle. Ad-agencies can utilise these data for targeted advertisements. Profile matching across the web can also be used in security purposes like background check, fake account identification, and rumour detection. In this thesis, along with linguistic analysis, we will exploit a user's topics of interest at different point of time and sentiment associated to those topics, to build a robust profile search engine.	1

Dr. Mohammed Eunus Ali (eunus)	Social Media Data Analytics: How to become one of the k most influential users	There are several works on 'maximizing the spread of influence' where the query is to find k users (called seeds) from a social network such that the number of users influenced by these seeds is maximized. An example application is when a new product is introduced in the market, the company can initially target a few "influential" members of the network — say, giving them free samples to trigger a cascade of influence by which friends will recommend the product to other friends, and many individuals will ultimately try it. The new idea is, given a social network and a particular user ux, find the set of new edges to be added so that ux becomes one of the k most influential users. An example application is to make suggestions to a political leader, the connections he should make so that he has high influence in online social media to spread his political views.	1
Dr. Mohammed Eunus Ali (eunus)	Find the Best Route for the Best View	Advancement in mobile and GPS technologies have enabled users to record and publish their route activities or trajectories through location based social networking sites such as Flickr or Yelp. These trajectories provide different insights of uses activities and paths they travel. For example, one can find the most popular path in a city from the historical routes of users. In this thesis, we will introduce a new dimension of trajectory data search that can work on a 3D real environment. More specifically, in a 3D city environment (e.g., Rome with all 3D buildings and bridges), a user may want to find a trajectory that gives the best view of a set of target objects (e.g., Colosseum, Ferro de Roma). We will develop efficient algorithms to efficiently process such queries.	2
Dr. Mohammed Eunus Ali (eunus)	Deep Learning and Spatial Data Analytics		2
Dr. Muhammad Abdullah Adnan (adnan)	Cutting Tail Latency in a Heterogeneous Cloud	Cloud computing platforms enable applications to offer low latency processing of user data by offering parallel services in several geographically distributed data centers. Achieving predictable performance is critical for many distributed applications, yet difficult to achieve due to many factors that skew the tail of the latency distribution even in well-provisioned systems. In this research, we will address the high user-perceived latency problem in cloud data centers. We will formulate the problem of how to minimize the tail latency in various conditions where high latency variance is inevitable. The goal of this research is to build a runtime scheduler that improves cluster utilization and job completion times by packing tasks with multi-resource requirements and inter-dependencies.	2

Dr. Muhammad Abdullah Adnan (adnan)	Geo-Distributed Data Analytics and Machine Learning	The recent explosion of data volumes has reignited the focus on scale-out data analytics, and has fostered the world of Big Data systems. While these paradigms suffice for a single data center, we have reached a new inflection point where the combination of big and geographically distributed data requires new approaches for geo-distributed analytics processing and machine learning to minimize wide-area bandwidth costs. Centralized approaches together with heuristics such as data reduction or ad-hoc distributed querying may suffice in the short term. However, they are not sustainable as data volumes grow relative to transoceanic bandwidth and regulatory concerns become paramount. In this research we will explore both model parallelism and data parallelism (inherent in Big Data) to achieve good speedup for geo-distributed Big Data analytics and large scale machine learning.	2
Dr. Muhammad Abdullah Adnan (adnan)	Collaborative Computing across Mobile Platforms and Cloud	Collaborative computing for energy conservation has recently been proposed in Mobile Cloud Computing. To address the challenges in response time and communication overhead across cloud and mobile end devices, data and computation are brought close to each other by adding an intermediate layer of surrogate servers (cloudlets) which are in logical proximity (within WiFi) of the end nodes. In this project, we intend to build tools for runtime support on mobile devices to partition, migrate and concurrently execute subtasks at nearby surrogate servers.	1
Dr. Muhammad Masroor Ali (mmasroorali)	Semantic Web/Ontology Based Bangla News Domain Classification	Loosely speaking, an ontology is a vocabulary of the classes~(types), properties~(roles), and interrelationships of the entities that really or fundamentally exist for a particular domain of discourse. It is thus a practical application of philosophical ontology, with a taxonomy, and the cornerstone for semantic web. We are going to use ontology to classify Bangla news items in different domains like national, politics, sports etc.	2
Dr. Muhammad Masroor Ali (mmasroorali)	Semantic Web/Ontology Based Bangla Named Entity Recognition	Loosely speaking, an ontology is a vocabulary of the classes~(types), properties~(roles), and interrelationships of the entities that really or fundamentally exist for a particular domain of discourse. It is thus a practical application of philosophical ontology, with a taxonomy, and the cornerstone for semantic web. We will find named entities in Bangla texts (mostly online news items) try to put in relevant classes.	3

Dr. Rifat Shahriyar (rifat)	Playing with Stack Overflow Data	We will try to answer any/all the following questions: 1. What are Java Enterprise/Python/JavaScript/General Web developers asking about? A large scale study using Stack Overflow. 2. Which language/framework/DB got the best answers from Stack Overflow? 3. How to help/guide job interview with the help from Stack Overflow data? Stack Overflow data sets are available.	2
Dr. Rifat Shahriyar (rifat)	Research on Smart Grid	Smart grid is a generic label for the application of computer intelligence and networking abilities to a dumb electricity distribution system. Smart grid initiatives seek to improve operations, maintenance and planning by making sure that each component of the electric grid can both 'talk' and 'listen.' Another major component of smart grid technology is automation. In many places, a power company will only know that service is out if a customer calls. In a smart grid scenario, if service is interrupted the company will know right away because certain components of the grid (smart meters in the affected area, for instance) stop sending sensor data. By ensuring that all the components of the grid -- from transformers to power lines to home electric meters -- have IP addresses and are capable of two-way communication, the company can manage distribution more efficiently, be proactive about maintenance and respond to outages faster. Research areas may be fault tolerance, load balancing, demand response using game theory, cyber security, data mining, machine learning etc.	2
Dr. Rifat Shahriyar (rifat)	Towards Implementing a Concurrent Garbage Collector in Jikes RVM	Garbage collection is an integral part of modern programming languages. It frees the programmer from manually dealing with memory deallocation for every object they create. Garbage collection was introduced in LISP and it has gained popularity through Java and .NET. It is also included in languages such as Haskell, JavaScript, PHP, Perl, Python, and Smalltalk. In garbage collection, the term mutator refers the application or program that mutates the heap. Collectors that must stop the mutator to perform collection work are known as stop the world collectors, as compared to concurrent or on-the-fly collectors which reclaim objects while the application continues to execute. The concurrent or on-the-fly collectors are the most difficult to implement. Jikes RVM is an open source high performance Java virtual machine (VM) written in a slightly extended version of Java. This topic will focus on implementing a state-of-the-art concurrent garbage collector in Jikes RVM. This topic requires a significant amount of understanding and coding in Java.	1

Dr. S. M. Farhad (smfarhad)	Radio Frequency Based Automatic Train-Approach Alert System	In spite of the rapid advance of latest technologies, the death toll at level crossings across the world is high and much higher in developing countries [2, 4, 8]. It is very important for the commuters to learn in advance when a train approaches towards a level crossing. Automatic train-alert system in the level crossing has been proposed and implemented since early age of train invention and some of the latest works are explained in [1-7]. A GPS based smart phone alert system is proposed in [7]. The system requires the GPS system of the phone to be on that consumes significant battery power. Telecom provider based location service based SMS alert system to mobile phones is presented in [3]. The telecom locations are not always precise to the location of the mobile users. CCTV based alerting system by image processing is proposed in [1]. The process requires CCTV to be installed all the level crossings and precise image processing at all weather condition. Sensor based automatic crossing-gate controlling system is illustrated in [4]. Radio based level crossing gate controlling system is presented in [5]. These systems [4, 5] are good for vehicles to be blocked before the gate but walking commuters often tend to pass the crossings when the gate is locked. A cloud based railway crossing information integration is illustrated in [6]. A fuzzy logic based decision- making system to install the alert equipment in an unmanned level crossing is demonstrated in [2]. A low-cost and easily adaptable automatic train approaching alarm system is very important for saving lives across the world. This research will focus on the following objectives. a)To design and implement an FM radio based alert system. b)To develop mobile phone application to generate FM-based warning with useful information. c)To develop intuitive algorithm for train approaching of high degree of reliability. The intended outcome of the research would be in two folds. First, develop a mobile app that reliably warns user of train-approaches. Second, design intuitive algorithms of train-approaches with high reliability.	3
Dr. S. M. Farhad (smfarhad)	Dynamic Resource Provisioning for Video Transcoding in IaaS Cloud	High-definition video applications are often challenging for mobile devices due to their limited processing capability and bandwidth-constrained network connection. Video transcoding has become an inevitable technology for on demanding video streaming service, which needs to be done in real-time for mobile devices. Since video transcoding involves extensive computation, performing transcoding using cloud resource is more cost friendly and time effective. It is challenging to use the cloud resources for video transcoding that minimizes the operating cost. We have to find out a suitable schedule algorithm for allocating virtual machine to scale video transcoding services on a given IaaS cloud.	2

Dr. Sadia Sharmin (sadia)	Community detection and recommendation in social network analysis	The Internet and many other complex networks have not been â€˜plannedâ€™ or â€˜engineeredâ€™ in their present form, but are the result of a (mostly) uncontrolled process. There are mathematical approaches to model the evolution of complex networks. The goal of this project is to survey some of them critically. Possible aspects are the following: â€¢ What methods are there to scout networks such as the www, and do they produce a faithful picture? â€¢ What are characteristic processes involved in the emergence of complex networks? How can they be modeled? â€¢ How and to what extent do (purely) graph-theoretic concepts apply to complex networks?	2
Dr. Sadia Sharmin (sadia)	Algorithm and Application	Independent set, Dominating set, Max Clique, Graph coloring is a well-known example of a notoriously hard computational problem: not only is it NP-hard to compute the chromatic number of a given graph exactly, but even obtaining any reasonable approximation is provably hard as well. So we will develop and test new heuristics for these kinds of problems.	1
Dr. Sadia Sharmin (sadia)	Urban Search and Rescue	Robotic urban search and rescue (USAR) is a challenging yet promising research area which has significant application potentials as has been seen during the rescue and recovery operations of recent disaster events. If we have some rescue robots customized for socio-geographic environment of Bangladesh, then we can search and rescue human at any hazardous site faster and more efficiently and can save more lives. Small robots are able to fly above damaged areas or crawl into collapsed buildings, cut off from road transport, which allows rescuers isolated from the scene to find those in most urgent need of attention. Using robotic technology in search and rescue missions for assisting the rescuers covers a large part of the robotic and artificial intelligence research themes. This type of applications involves different research areas, from mechanical design and sensors interpretation to perception analysis, decision making, mapping, path-planning and victim detection.	2

Dr. Tanzima Hashem (tanzimahashem)	Efficient Algorithms for Ridesharing Applications	Nowadays, ridesharing and ridesourcing applications like and Uber Carma (https://www.gocarma.com; https://www.uber.com) that provide information for cost effective trip and activity planning have become ubiquitous and popular in smart cities. In a ridesharing application, drivers (owner of private cars) and riders share their source and destination locations along with their detour length constraints and time windows when riders need to be picked up and dropped off. The service provider identifies groups consisting of a driver and multiple riders that satisfy the car capacity and other constraints. In this thesis, we will focus on developing algorithms for efficient processing of ridesharing services.	2
Dr. Tanzima Hashem (tanzimahashem)	Big Data Privacy	The advancement of technology in generating, capturing and storing data at enormous speed and volume has opened the door for novel applications. In healthcare, efficient and cost effective genome sequencing has enabled researchers to reveal the correlation between genetic variants and an individual's predisposition to diseases or response to the treatment. Thus, medical tests are now turning towards a more personalized route. The tremendous benefits of big data like large volume of complex genome datasets come along with new privacy concerns. Disclosure of sensitive genomic data may cause various privacy threats like genetic discrimination, exposure of susceptibility to diseases, and revelation of genomic data of relatives (possibly without their consents) due to the hereditary nature of genomes. Therefore, to continue the growth of revolutionary applications on genomes, privacy protection is essential. In this thesis, we will focus on protecting privacy of genome data while processing a disease risk query, i.e., the probability of an individual to develop a specific disease.	2
Dr. Tanzima Hashem (tanzimahashem)	Ubiquitous computing: Location-Based Services with Crowdsourced Data and Computation	With the proliferation of mobile devices and wireless technologies, location based services (LBSs) are becoming popular in smart cities. Answers of location based queries are more reliable and satisfiable if they come from trustworthy crowd instead of traditional location service providers (LSPs). In this thesis, we will develop an approach to evaluate trip planning queries with crowdsourced data and computation that eliminates the role of an LSP. For a given source and destination locations of a user and POI types (e.g., a hospital, a restaurant or a shopping center), a trip planning query returns locations of a set of POIs of specified types that minimize the userâ€™s trip distance.	1
Prof. Dr. Md. Monirul Islam(mdmonirulislam)	Performance evaluation and modifications of Machine learning algorithms for big data		2
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