

My area of research interest is already mentioned in my personal webpage. I am interested to work in any ICT based areas. However, in this page my effort is to compile some of the research topics for potential PhD students and collaborators to start a discussion from. For further query/discussion you are encouraged to email me: Mohammed.Kaosar@murdoch.edu.au

1. **COVID compliant smart home:** senior citizens are needed to be cared by family or care givers. This increases the interactions which is one of the enemies for 'social distancing'. Under this project we can propose a smart home that will monitor/predict the inhabitant's activities and would generate alarm in case of abnormality. The abnormality can be detected by intelligent algorithms using various data the sensors (IoT) would generate.
2. **Privacy preserving COVID compliant smart home:** The above idea can be extended to ensure the privacy of the inhabitants.
3. **Privacy preserving complaint system:** Privacy preserving complaint system using distributed (threshold) encryption system. A person can only be convicted if a threshold number of complaints are reported. This will address (1) some people are too shy (or not confident enough or don't feel secure) to report a complaint (e.g. sexual harassment) (2) the person against whom the complaint is filed remain unknown unless a threshold amount of complaint is filed.
4. **Warning and correction in correction centers:** Above model can be applied in a situation where the system tolerates certain threshold and beyond that it would issue some warning or correction opportunity to the perpetrator (while preserving his privacy) before a legal action is taken.
5. **Wildlife crowd prediction:** Wildlife conservation (or preservation) authorities perform various activities all around the world to ensure better environment for wildlife. They tag (using e-tag, sensors) various endangered (or simply a wild) animal to ensure that they would not be lost or abused. They are concerned about providing necessary resources for their smooth survival on time as well (e.g. food, shelter, water etc.). We can model/predict their crowd and take a pre-emptive measure to provide them enough resources before they run out. This would save lot of wildlife. We can predict their presence/absence at various spots as well (this information is important for visitors and researchers). Similar idea can be applied in case of farming (animal service, harvesting etc.....)
6. **Privacy preserving crowd prediction:** The human crowd sensing solutions usually do not take the privacy into consideration. Under this study we can propose a privacy preserving (either using cryptography or differential privacy) crowd sensing solution.
7. **Cloud service prediction:** In cloud, tasks are required to be distributed to various cloud servers. An intelligent prediction system could better distribute these tasks.
8. **Privacy/security issues in precision agriculture:** Various privacy and security issues are to be addressed e.g. authentication, access control are very important to ensure quality, resilience against attack etc.
9. **Intellectual capital theft in business:** In various business e.g. farming, intellectual capital is in danger as ubiquitous IoT is in use.
10. **Preparing the education system for future pandemic:** Academic integrity is one of the biggest challenges the education sectors face(d) during COVID-19. We need to ensure academic integrity for various assessments as those went online (hence no practical invigilation is

possible). Community based exam halls (probably needs government intervention) might be a solution

11. **Privacy preserving distributed system:** This is an umbrella term which may consists of number of systems such as – privacy preserving data mining, privacy preserving location sensing, privacy preserving data science (for all data science algorithms)