Project Suggestions – 2020

A. Distributed systems
   1. X-Paxos/E-Paxos extensions to handle byzantine+leaderless+asynchronous scenarios (branching off from current research); use Go or DistAlgo
   2. Composable multiple blockchain operations using DAML (res. problem – verification)
   3. Broadcast abstractions for k-set agreement problem under CFT/BFT
   4. Randomised algorithms for max-registers problem under Byzantine conditions
   5. Randomised algorithms for scalable-reliable broadcast under Byzantine conditions

B. Optimisation
   1. Bi/tripartite graph stable matching for the producer-middleman-consumer problem
   2. PTAS for calculating pareto frontiers for multiobjective optimisation problems– case study: energy provisioning landscape of a country

C. HPC
   1. Parallelisation of tensorflow CNN/RNN modules using GPU/message passing/shared memory/dataflow paradigms

D. Other
   1. Privacy preserving federated ML (e.g. stochastic gradient descent problem) using SMC/SPDZ etc.
   2. Streaming data cluster identification for a) non intrusive load monitoring (DEBS 2020 challenge) or, b) biomedical signal analysis using CEP/Siddhi (continuation of past work).

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