Research Topics

1. Distributed algorithms

    (i) Broadcast abstractions for k-set agreement problem under CFT/BFT
    (ii) Randomised algorithms for max-registers problem under Byzantine conditions
    (iii) Randomised algorithms for scalable-reliable broadcast under Byzantine conditions
    (iv) Randomised/deterministic paxos consensus variants under leaderless+async+BFT/game theoretic assumptions

2. Combinatorial optimisation

    (i) Bi/tripartite graph stable matching (stable marriages problem)/fairness issue
    (ii) PTAS/game theoretic/evolutionary approaches for calculating pareto frontiers for multiobjective combinatorial optimisation

3. Misc.

    (i) Privacy preserved federated ML (e.g. stochastic gradient descent problem) using SMC/SPDZ etc.
    (ii) Abstract models of computations for emerging neural architectures (recurrent, convolutional, LSTM etc) and their Turing completeness
    (iii) Multi objective Reinforcement learning for autonomous control
    (iv) Scientific workflow composition with channel coordination abstraction
    (v) Streaming graph summarisation for graph querying
    (vi) DSTM as a model for permissioned distributed ledgers

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