nest4ai v. ai4nets

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http://www.cl.cam.ac.uk/~jac22

https://www.turing.ac.uk/people/researchers/jon-crowcroft
AI – some incr pbs

• Scale training
  – Data center/distributed, e.g. for SGD
  – HPC interconnect for graph data
• Secure/confidential analytics
  – Enclaves/TEEs
  – Secure MPC, homomorphic crypto
  – Differential privacy
• Compressed NNs on mobile
• Interpretability
Net – some incr pbs

• Diversification&Scale
  – IoT – home net, smart bldg, city: lorawan etc
  – Access nets > 100Mbps
  – data centers – 100Gbps

• Management
  – Configuration
  – faults
  – Resource control
Nets4ai – some incr pbs

• Low latency – maybe not tcp
• Privacy – not tls anymore (noise)
• In-net aggregation (not general purpose tho)
ai4nets #1

• Physical/link layer
  – Traditional (“training”)->coding/modulation
  – Coop relay/coding?

• Network layer
  – Traditional traffic engineering
  – Multipath?

• Transport
  – Traditional – congestion control/management
  – Co-flow?
  – TAPS?
ai4nets #2 mostly incr

• Application layer
  – Traditional caching
  – Predictive fetch/replication
  – Migration

• User layer
  – Behavioural model/QoE
  – Pricing
  – Evil?
ai4nets #3- aybe disruptive

• Compressive sensing of net stats, summariser
• Optimisation (TE, caches, etc)
• Classifiers – flows classical, mostly
• Anomaly detection – classical&neural
• Faults – may be(bayesian) model inferencing
• Interpretability– operations (medic&net) need
Net4ai4nets – more disruptive?

• Verify software stacks
  – Including p4/sdn controllers etc
  – Verifiers might use heuristics/ml to prune

• Distributed learning of distributed problems
  – Edge ML

• Mobile fault-localize
  – Distributed model acquisition

• Model>classifier (GAN) > model

• Interpretability/Explainability (esp Deep)