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)