NINES

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10/2/2026

Wireless, Cellular, and Satellite Networking

- Performance Isolation for 5G RAN Slices Across Multiple Interfering Cells.
- EcoCell: Energy Conservation through Traffic Shaping in Cellular Radio Access Networks.
- What Obstructed Skies Teach Us about Satellite Internet.
- Stealthy Low Earth Orbit Satellite-to-Ground Quantum Communication.
- CrowdLink: Unlocking Idle LEO Network Capacity with User Terminals.
- BISCAY: Practical Radio KPI Driven Congestion Control for Mobile Networks. (Could be moved to congestion control, too)
- OrbitalBrain: A Distributed Framework For Training ML Models in Space. (something about AI, too?)

Performance Isolation for 5G RAN Slices Across Multiple Interfering Cells.

- Take Home – RadioNinja is a very cool name
- Pro – slicing and dicing at RAN - useful
- Con – kind of obvious, but…doesn’t it need operators agreement
- Idea – look at cooperative relaying, coding and megamimo as well

EcoCell: Energy Conservation through Traffic Shaping in Cellular Radio Access Networks

- Take Home – surprise: can save a up to 35% by good system choices
- Pro – traces and real deployability (s/w only soln)
- Con – all techniques known (higher rate mod = less symbols etc)
- Idea – Carbon Tax on networks&data centers

What Obstructed Skies Teach Us about Satellite Internet.

- Take Home – Eclipses can be closer to home than you thought
- Pro – neat opposite of earth observation
- Con – what angle does obstruction subtend?
- Idea – both astronomers and earth observation folks care!

Stealthy Low Earth Orbit Satellite-to-Ground Quantum Communication.

- Take Home – onion routing with entanglement
- Pro – actually a v. cool idea that removes main –ve QKD objection
- Con – practicality and government objections
- Idea – why not use satellite to do QKD to end user dev? Remove PKI

CrowdLink: Unlocking Idle LEO Network Capacity with User Terminals.

- Take Home – tethering works for starlink too
- Pro – uses spare (and actually otherwise wasted) capacity
- Con – user impact on battery (or bills)
- Idea – what if we do this across different provider constellations?

BISCAY: Practical Radio KPI Driven Congestion Control for Mobile Networks.

- Take Home – can measure faster than RTT
- Pro – useful framework
- Con - was already done for MPTCP in mobile with wifi/bt/cellular and policy module
- Idea – use MPTCP/QUIC and or NPD packet spray/dicing

OrbitalBrain: A Distributed Framework For Training ML Models in Space.

- Take Home – FL as rocket science
- Pro – some plausible figures
- Con – very limited scale and lifetime
- Idea – training doesn’t need low latency – ship it to Geo Sats which can carry big payload – inference is where latency need is low, so move that to the ground.

The Outlook is Summary.

- If NINES were SIXES