The Future of Networking Research

It's so Bright we All Have To Wear Blinders

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The good news. . .

- application is only discipline (beyond medicine) with regular media coverage
- Infocom: 2,200 authors and reviewers
- best Infocom attendance
- abundance of journals, conferences,
- almost every CS/EE department wants networking faculty
- close to becoming core course in undergraduate and graduate
- but: “pig cycle”

But. . .

"Telephone research?": no major telephone research since the 1950's

Installed base: can do specialized OS (parallel, multimedia, . . .) even with Microsoft; ATM = last specialized network

Infrastructure: anything outside end systems takes forever (RSVP, multicast, . . .)

Standards vs. research: IETF participation ↓

Patent everything: whole areas difficult to build tools (multimedia)

"Sell everything": university admins, VC, . . .

Everything proprietary: can't just put grad students on highway bridge

Research careers: not attractive for non-US students

DARPA: very specialized funding

Dependent on physical level: and they are getting network-savvy

Bag of tricks: research = permutation

Time horizon: wrong notion of "Internet time" – most things still take 5 years

The Decline of the General-Purpose Labs

Lucent	switching, layer 3
IBM	web, data applications, e-commerce
Telcordia	phone consulting, IP hand-holding for telcos
AT&T	traffic and network management

Some Trajectories

Automobile $\longrightarrow$ highway engineering: research in a major infrastructure, but don't worry about number of wheels on car

Mechanical engineering, control theory: required undergraduate course, but little university/high-profile research ➠ instruction, consulting, tutorials, …

Low complexity systems research: try to reduce system complexity (rather than just adding to standards)

Good Research is . . .

- widespread commercial use 5 years out (some protocol work)
- enables new service or application
- improves performance of a bottleneck component by more than (say) 50%

White Spots on the Map

- infrastructure: complexity, reliability, performance
- land grabs: TV, radio, telephone, ATMs