

Dijkstra

Computer Science is no more about computers than astronomy is about telescopes.

Alan Turing thought about criteria to settle the question of whether machines can think, a question of which we now know that it is about as relevant as the question of whether submarines can swim.

It is practically impossible to teach good programming to students that have had a prior exposure to BASIC: as potential programmers they are mentally mutilated beyond hope of regeneration.

COBOL is for morons.

Maths, Physics and Computers

- Unreasonable Effectiveness of Mathematics in the Natural Sciences.
- True of Maths and *Mathematicians* in the area of Computers.
- Maths and programming are similar.
- Alan Turing, Claud Shannon, Donald Knuth, ...

`maths.tcd.ie`

1980 First Unix system in Ireland.

198X e-mail for students.

1990 Public time service.

1993 Third web server in Ireland.

1995 Move to Open Source Unix
(Linux, FreeBSD).

1999 IPv6 experiments begin.

802.11b: Wireless Networking

New technology for networking laptops without cables.

- Uses microwaves
($f = 2.4 - 2.484\text{GHz}$, $\lambda \approx 12\text{cm}$).
- Range about 100m.
- Claimed speed 11Mbps.
- Works like ethernet.

Encryption

- Signal goes about 100m, is this too far?
- How to get privacy? Use *cryptology*.
- 802.11 comes with WEP encryption, uses a *shared secret* key.
- Cryptanalysis gives *probabilistic* attacks on WEP.

Nyquist and Noise

data rate = $2 \times \text{freq range} \times \log_2(\text{levels})$

How many levels?

Shannon and Shouting

max rate = $\text{freq range} \times \log_2 \left(1 + \frac{\text{signal}}{\text{noise}} \right)$

no matter how we code the message!

If 802.11 was as clear as a telephone,
then 5 channels with 160Mbps each.

Waiting your turn

802.11 is like a polite dinner party.

Before you speak:

1. Wait for quiet.
2. Pause to see if someone talks.
3. Start talking, if you clash go to 2.

Queueing theory, looks at:

1. Supermarket queues,
2. Traffic jams,
3. Data in networks,
4. ...