An aerial photograph of a coastal city. On the left is a large blue bay with a sandy beach. The city extends along the coast and inland, featuring a mix of residential buildings and green spaces. In the foreground, a large university campus is visible, with several multi-story buildings and green lawns. The sky is clear and blue.

Tuesday

10.00 Cargo cult of everyday things

11.30 Cargo cult of mobile phones

14.30 Cargo cult of calculators

Wednesday

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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TIFF (Uncompressed) decompressor
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An aerial photograph of a coastal city, likely Seattle, showing a large bay with a sandy beach and a university campus with several large buildings and green spaces. The text is overlaid on the image.

- Computer science will save the world

- It is making a mess of the world

- Your job is to fix it

An aerial photograph of a university campus situated along a large body of water. The water is a deep blue, and a wide, light-colored sandy beach runs along the shore. The campus consists of several large, modern buildings with flat roofs, interspersed with green lawns and trees. In the background, a city is visible on a hillside. The text "Last week, in computer science..." is overlaid in red on the left side of the image.

**Last week,
in computer science...**

An aerial photograph of a coastal city, likely Swansea, showing a large bay with a sandy beach and a university campus with several buildings and green spaces. The text is overlaid on the image.

Lecture 1

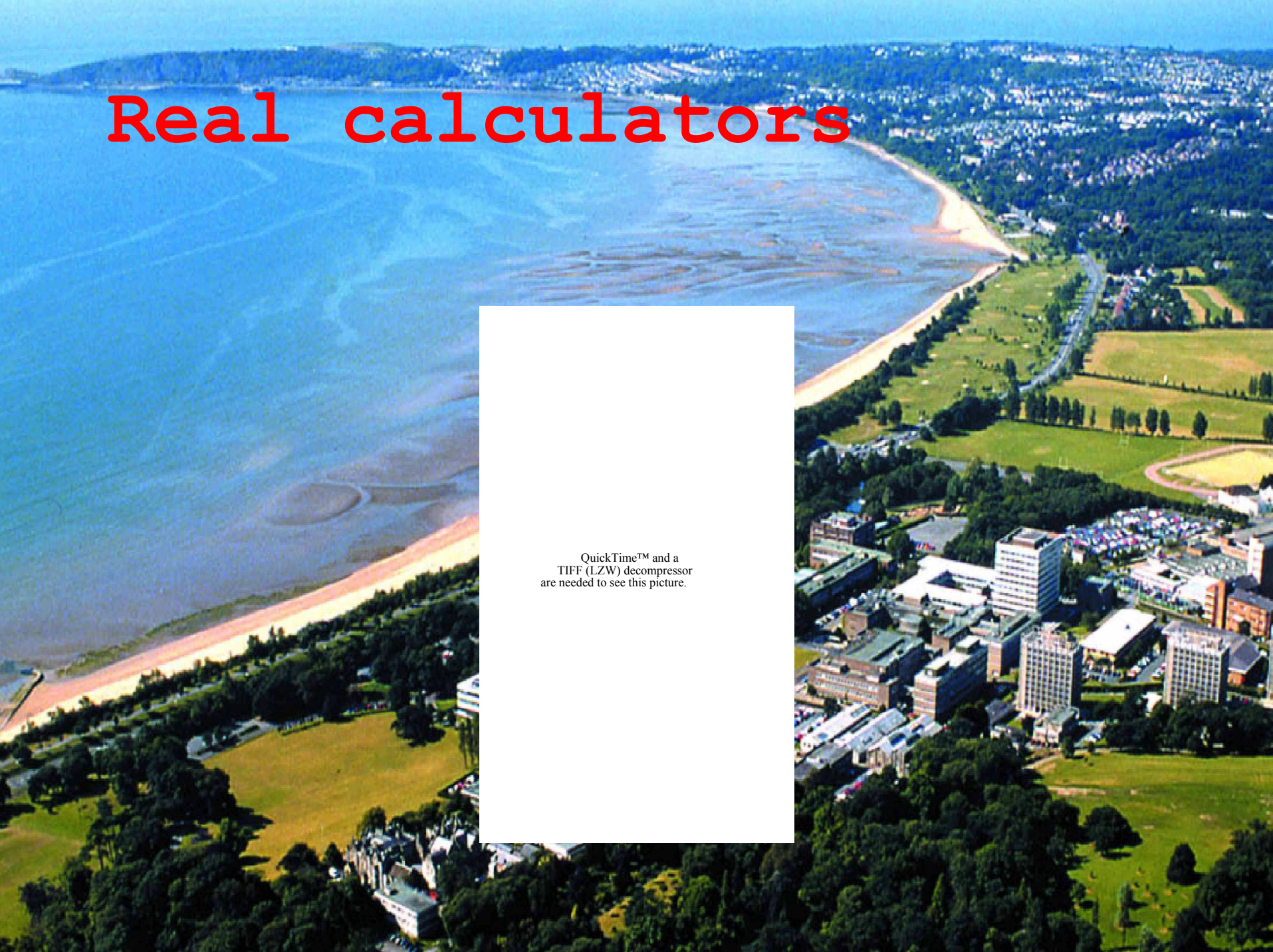
The cargo cult of everyday computing (and a cure)

Harold Thimbleby
University of Swansea

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

Real calculators

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.



Best solutions

- $M+ \quad - \quad MRC \quad M+ \quad MRC$

- $= \quad - \quad MRC \quad M+ \quad MRC$

- *IF ... 2 conditions apply*

MULTIFUNCTION







For more photos of your favorite cars visit www.roadfly.com



- **United States Patent 6277029**
- The present invention provides a hand-held portable device capable of tracking and incorporating valuable golf performance statistics to allow a player to identify weaknesses in game play. The present invention includes a hand-held device for storing and processing golf scores. The device has a logic device for processing executable commands and is in electrical communication with a memory, an input device, and an output device. The memory includes an interface module configured to generate prompts for player identification and performance data. The prompts are displayed on the output device. The performance data reflects golf scores and other areas of

An aerial photograph showing a coastal town with a large body of water on the left, a sandy beach, and a university campus with several buildings and a large green field on the right. The town is built on a hillside overlooking the water.

QuickTime™ and a
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An aerial photograph showing a coastal town with a large body of water on the left, a sandy beach, and a university campus with several buildings and a large green field on the right. The town is built on a hillside overlooking the water.

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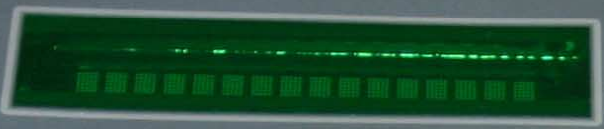
Syringe pumps

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

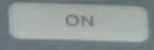




AC



totalizer



Graseby Syringe Pump



Clotting Factor Concentrate Infusion

DO NOT SWITCH OFF OR ALTER RATE
without contacting the Haemophilia Centre

Nurses: Ext 4248 (bleep 328 Sat/Sun 9am-1pm)
SpR: Bleep 811



Graseby simulator demo





In contrast...

- The "human factor"
 - 'Pilot error'
 - 'Operator error'
 - 'Nurse error'
- More often than not "system error"



Nurse error?

- Set at 0.1ml/hr
- Syringe pump on pause
- Beeps after 2m
- Should press Cancel
- But nurse pressed 10 – which cancels beep
- Now dosage is 10.1ml/hr
- Baby dies

Nurse error

We did not feel that any criticism of the pump design was warranted. The device control panel is intended for single finger operation and the two buttons described are situated an adequate distance apart.

Institute for Safe Medication Practices, 2002

Common errors

- 7ml/hr entered as 77ml/hr
 - Pressed 7 twice by mistake
- 0.5ml/hr entered as 5ml/hr
 - Didn't press . hard enough
- 10ml/hr entered as 200ml/hr
 - Obscured display
- Device defaults to 0.1mg/ml
 - But using 1mg/ml

1983-7, 6 'accidents'



Diagnostics from Therac



MALFUNCTION n

- $1 \leq n \leq 64$

- No documentation

- No indication of severity

- Errors 40 times a day!

21 March, 1986

- Operator entered x instead of e
Moved cursor and "corrected" error
Began treatment
MALFUNCTION 54
Continued Treatment
MALFUNCTION 54
Machine shutdown
- Patient pounds on door
- Dies 5 months later

Transfer errors





Help not implemented for ContextID 0011

[Previous Screen](#)

SNCF accident

b) Plusieurs véhicules sont bloqués, le mécanicien: S'assure que ce clochage n'est pas la conséquence de la fermeture d'un robinet d'arrêt de la conduite générale situé avant la partie de train bloquée:

- 1er CAS: Aucun robinet d'arrêt CG n'est fermé:
 - Il actionne la commande de la valve de purge le temps suffisant pour provoquer le desserrage sur chaque véhicule bloqué.
- 2e CAS: Un (ou plusieurs) robinet d'arrêt est trouvé fermé:
 - Il ouvre le robinet.
 - Dans les 2 cas, le mécanicien:
 - ouvre le robinet d'arrêt CG situé en arrière du dernier véhicule relié à la CG.
 - vérifie le serrage des freins du dernier véhicule freiné.
 - ferme le robinet CG.
 - vérifie en se dirigeant vers la tête du train:
 - le desserrage des freins de tous les véhicules.
 - que le clochage n'a pas provoqué d'avarie aux roues.

SNCF accident

b) Plusieurs véhicules sont bloqués, le mécanicien: S'assure que ce blocage n'est pas la conséquence de la fermeture d'un robinet d'arrêt de la conduite générale situé avant la partie de train bloquée:

1er CAS: Aucun robinet d'arrêt CG n'est fermé:

- Il actionne la commande de la valve de purge le temps suffisant pour provoquer le desserrage sur chaque véhicule bloqué.

2e CAS: Un (ou plusieurs) robinet d'arrêt est trouvé fermé:

- Il ouvre le robinet.

Dans les 2 cas, le mécanicien:

- 1) ouvre le robinet d'arrêt CG situé en arrière du dernier véhicule relié à la CG.
- 2) vérifie le serrage des freins du dernier véhicule freiné.
- 3) referme le robinet CG.
- 4) vérifie en se dirigeant vers la tête du train:

- le desserrage des freins de tous les véhicules,
- que le blocage n'a pas provoqué d'avarie aux roues.

Il applique les mesures concernant le signalament et la reprise de marche (article 385)

Airbus A321

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

An aerial photograph of a coastal town and harbor. The water is a deep blue, and the shoreline is a mix of green fields, trees, and buildings. A large, curved beach is visible. The text 'A321' is overlaid in the top left corner.

A321

ALTERNATE BRAKING WITHOUT ANTI-SKID

The anti-skid system is deactivated:

- electrically (A/SKID and N/W STRG sw OFF or power supply failure or BSCU failure)
- or hydraulically (Y+G sys to lo press, the brakes are supplied by the brake accumulators only).

A321 revised

ALTERNATE BRAKING WITHOUT ANTI-SKID

Alternate braking without anti-skid mode is achieved when **any of**

Or Anti-skid switch set OFF **and** Nose wheel steering switch set OFF

Or BSCU failure

Or power supply failure

Or autobrake is inoperative **and both** green **and** yellow hydraulic pressure insufficient



Setting the new multimeter standard

The new 170 series are the new benchmarks for multi-purpose multimeters

All models measure True RMS for correct measurements independent of the signal waveform (other multimeters could measure non-sinusoidal signals up to 50% wrong). They have new features including a backlight display (177, 179), min-max-average recording and temperature measurements (179) in a familiar shape and size. The 6000-count digital display with analog bargraph offers readings twice as fast as other multimeters.

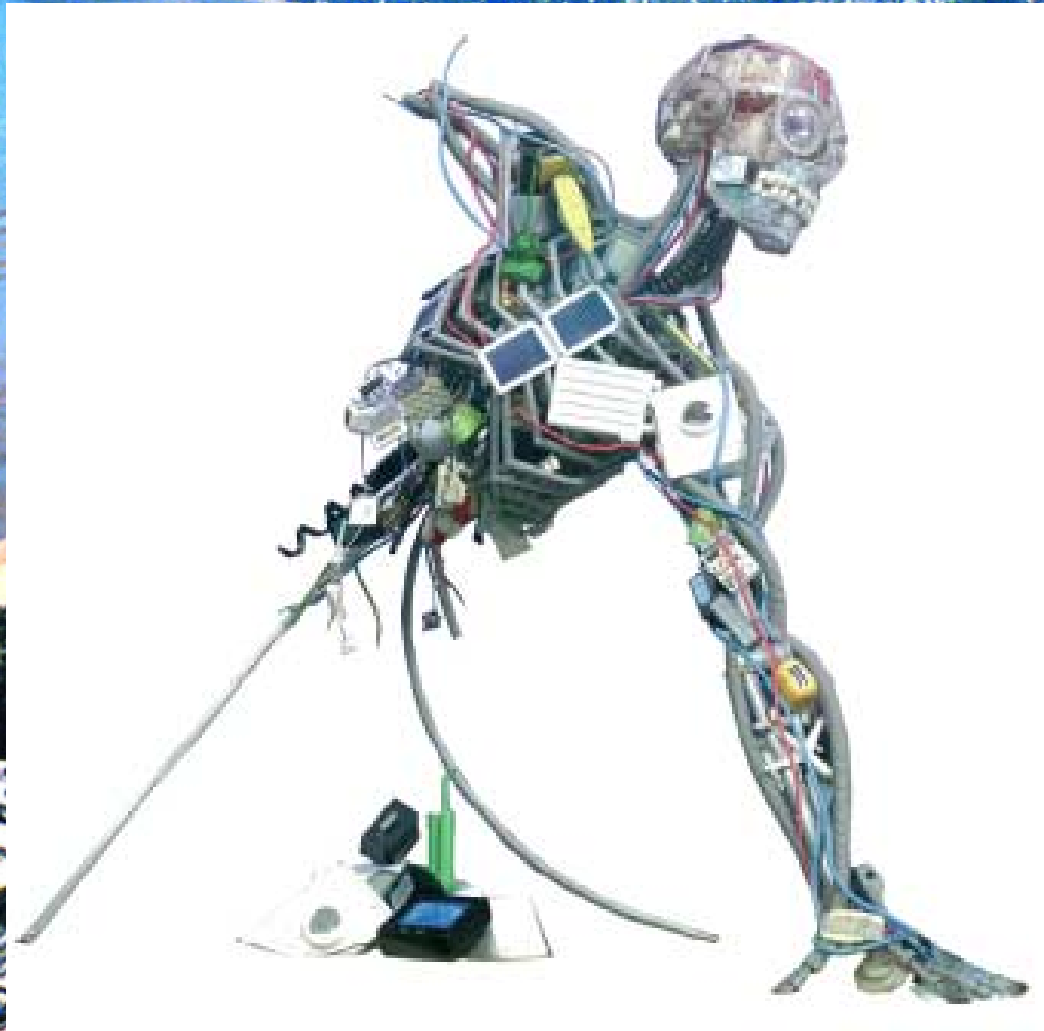
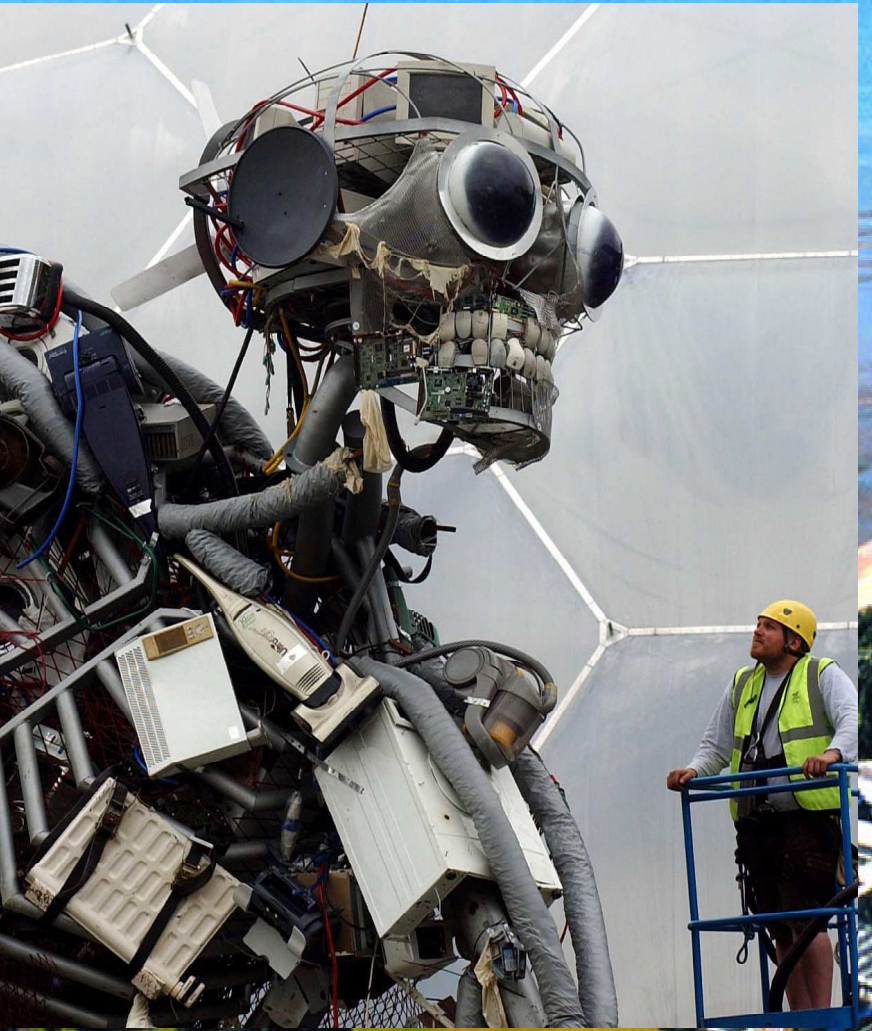
The 175, 177 and 179 meters allow calibration adjustments to be made via the front panel. Battery replacement is done through a battery access door without opening the complete case and voiding calibration seals.

The Fluke 170 Series tools meet the latest EN61010 CAT III 1000V and CAT IV 600V safety ratings. The meters are compatible with the optional ToolPak accessory which allows the user to hang the meter with a strap or magnet and keep both hands free to move the test leads around for optimum safety and control.

[Click on the rotary knob and buttons to get a virtual demonstration of the different functions.](#)

My Fluke 185





Conclusions

- Most errors are CS design errors
- Design errors are fixable
- Worth doing...

Be ambitious

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QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Sam









An aerial photograph of a university campus situated along a large body of water. The water is a deep blue, and the shoreline is a mix of sandy beach and green grass. The campus consists of several large, modern buildings with flat roofs, interspersed with trees and green spaces. In the background, a city is visible on a hillside under a clear blue sky.

**Are design problems
Computer Science
problems?**

Computer science...

- To make (current & future) systems
 - more dependable
 - easier to use
 - more satisfying
 - **more often!**
 - driven by general theories (and tools)

