

Find Yourself in Computer Science!

Rob Stewart (F28SG & F20DP Course Leader)

October 2026

Talk overview

Part 1: Tech in Edinburgh

- Meetups
- Online groups

Part 2: Standing out

- Employability
- Honours dissertation

Part 3: languages

- Paradigms
- Our degree programmes

Part 4: Linux

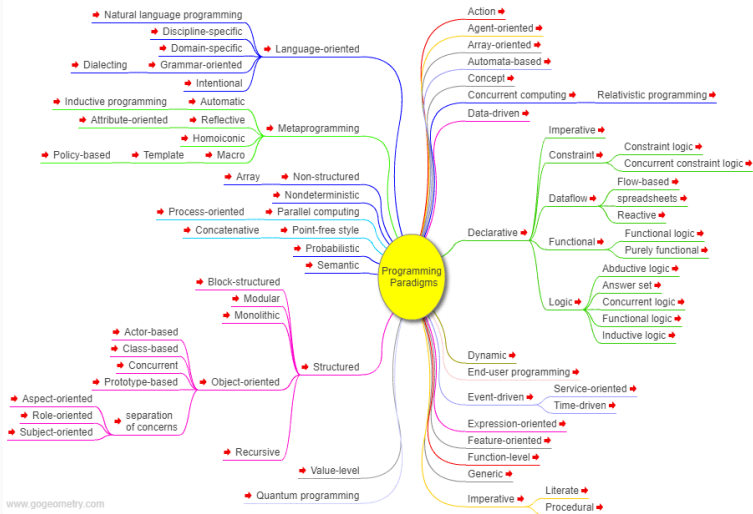
- History
- Linux at Heriot-Watt

Part 3: Programming languages

You will be exposed to many programming languages

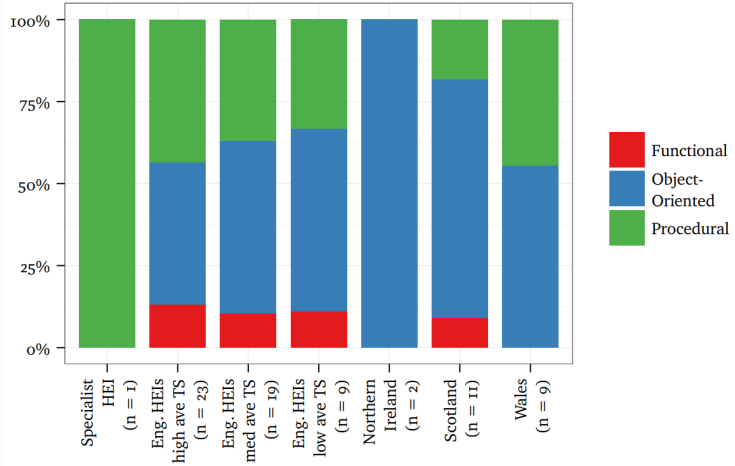
Do not worry...

Once you've learned a few, you know them all

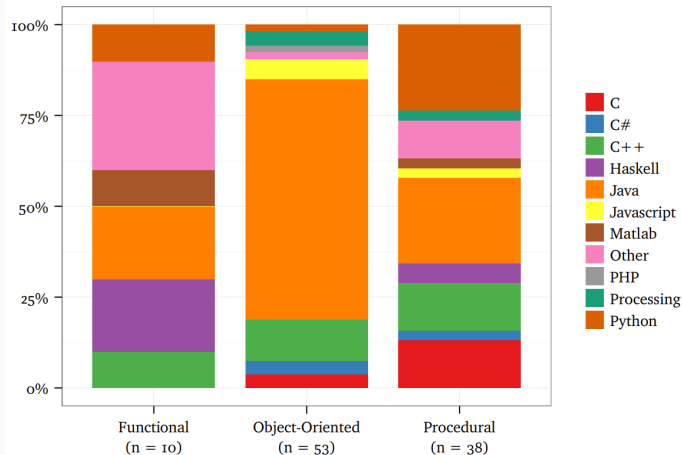


www.gogeometry.com

Be conscious of your bias towards your **first** language

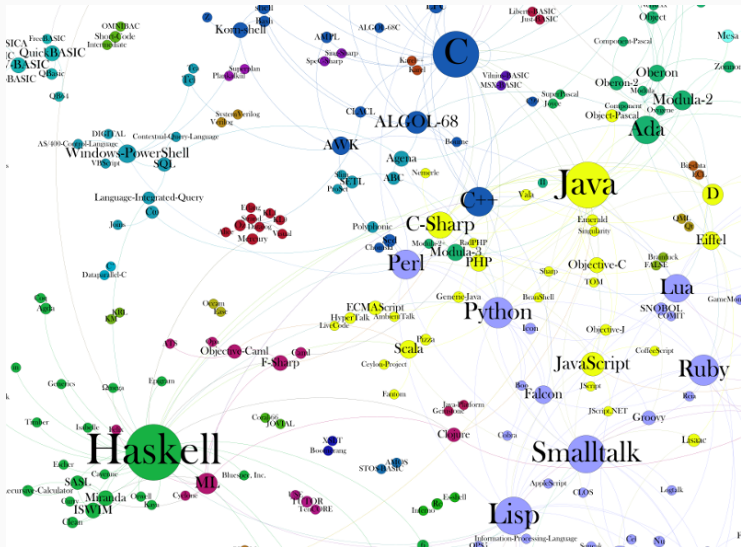


*"An Analysis of **Introductory Programming Courses** at UK Universities"*, Ellen Murphy, Tom Crick, James H Davenport, April 2017.



3.3 Paradigm Taught

Instructors were asked which paradigm was being taught in their introductory programming course, regardless of what is traditionally thought to apply to the language(s) in use. This question, understandably, caused some dissatisfaction in the comments section, with **many participants noting that more than one paradigm is taught in their course**. Although this was to be expected, we wanted to be able to



"influenced" relations according to WikiPedia
<https://griffsgraphs.wordpress.com/2012/07/01/programming-languages-influences/>

Year 1

Semester 1	Semester 2
F27SA Software Development 1	F27SB Software Development 2
F27ID Introduction to Interaction Design	F17SC Discrete Mathematics
F27PX Praxis	F27CS Introduction to Computer Systems
F17LP Logic and Proof	F27WD Web Design and Databases

Java points to F27SA

Java+Python points to F27SB

C+Assembly points to F27CS

SQL+PhP+CSS points to F27WD

Year 2

Semester 1	Semester 2
F28ED User-Centred Experimental Design	F28SD Introduction to Software Engineering
F28WP Web Programming	F28DM Database Management
F28SG Introduction to Data Structures & Algorithms	F28HS Hardware-Software Interface
F28PL Programming Languages	F28DA Data Structures & Algorithms

Java points to F28SG

OCaml points to F28PL

SQL points to F28DM

C+Assembly points to F28HS

Java points to F28DA

Advanced concepts in years 3&4 : C++, Haskell, SYCL, OpenMP, ...

Part 4: Linux

Lab rooms

- Microsoft Windows labs
 - Ground & first floor of Earl Mountbatten
 - GRID Digital Lab
 - Games development, .NET & Java programming
- Linux lab in EM 2.50
 - Most of our programming courses

Access to Heriot-Watt computing resources

- Remote Linux
 - ssh gateway with multi-factor authentication
 - <https://www.macs.hw.ac.uk/cs/faq.html#Qm4>
- Remote Windows
 - Keyserver website to find available computer
 - Accessible from Windows, MacOS and Linux

What is Linux?





- In 60's computers ran different Operating Systems



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- New OS in 1969 by Dennis Ritchie and friends at Bell labs
 - Simple and elegant
 - Written in the C programming language
 - Designed an OS kernel



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They called it “**Unix**”



AT&T Archives: The UNIX Operating System



AT&T Tech Channel

99.7K subscribers

Subscribe

@LemystereManCarloc 3 years ago

These guys built the backbone of almost every server, mobile device, iot, and apple device in existence. Unix + C has held for 40 years.



2.7K



Reply

▼ 78 replies

But..., Unix was proprietary, and *not free*

But..., Unix was proprietary, and *not free*

Enter **Richard Stallman** in September 1983...

From: RMS@MIT...@mit-eddie.UUCP (Richard Stallman)
Newsgroups: net.unix-wizards,net.usoft
Subject: new UNIX implementation
Posted: Tue Sep 27 13:35:59 1983
Organization: MIT AI Lab, Cambridge, MA
Lines: 90

Free Unix!

Starting this Thanksgiving I am going to write a complete Unix-compatible software system called GNU (for Gnu's Not Unix), and give it away free to everyone who can use it. Contributions of time, money, programs and equipment are greatly needed.

To begin with, GNU will be a.....

GNU was born.

But one thing was missing from GNU...a *free* kernel.

But one thing was missing from GNU...a *free kernel*.

Enter Linus Torvalds in July 1991...

```
From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)
Newsgroups: comp.os.minix
Subject: Gcc-1.40 and a posix-question
Date: 3 Jul 91 10:00:50 GMT
```

Hello netlanders,

Due to a project I'm working on (in minix), I'm interested in the posix standard definition. Could somebody please point me to a (preferably) machine-readable format of the latest posix rules? Ftp-sites would be nice.

Linux was born

Dennis Ritchie

- Invented the **C programming language**
- Invented **Unix**, with Ken Thompson



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- Launched **GNU project** in September 1983
- Founded **Free Software Foundation**, Oct 1985
- Main author of the **GNU license**



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Linus Torvalds

- M.Sc. thesis “**Linux: A Portable Operating System**”
- Released **Linux** in October 1991
- Released **Git** in April 2005



25:40 / 1:25:09

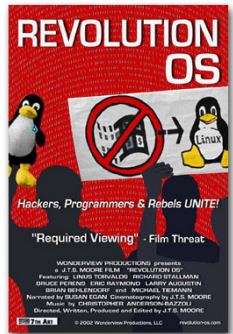
Revolution OS

3dkelvin · 34 videos

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213,837

1,880 41

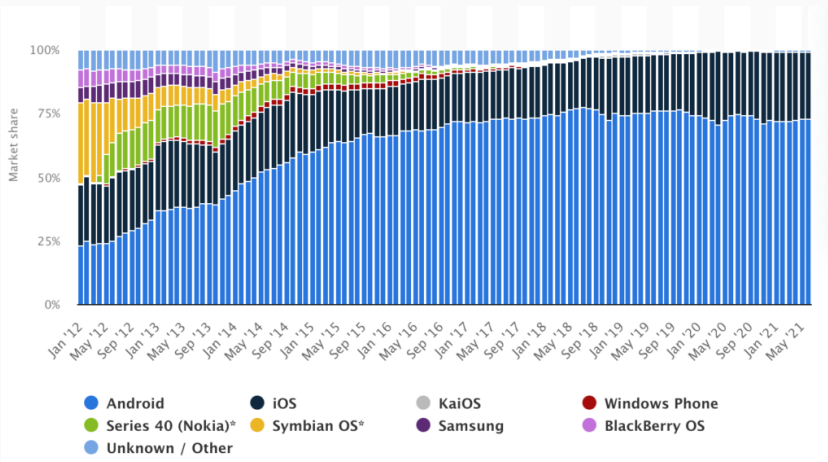




Linus Torvalds - How Linux Started

https://www.youtube.com/watch?v=fg_XzyVyhDU

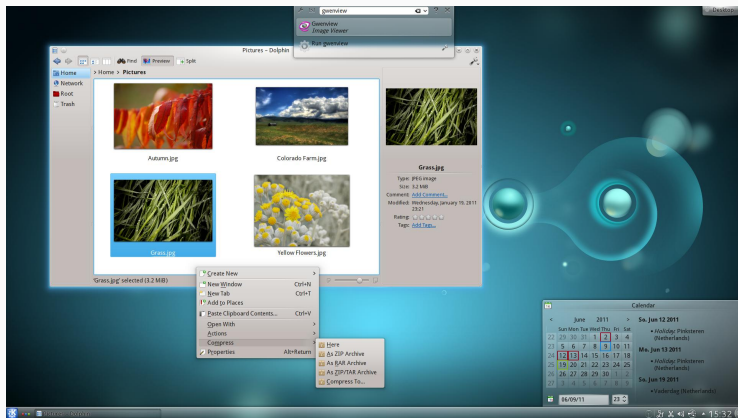
- Developed by 1000's of people worldwide
- Ubiquitous
 - Mobile: Google Android (~75% smart phones)
 - PCs & laptops
 - IoT: embedded smart devices
 - Samsung and LG Televisions
 - Autonomous cars
- Linux drives the web (97%)
 - Facebook, Google, Pinterest, Wikipedia,...

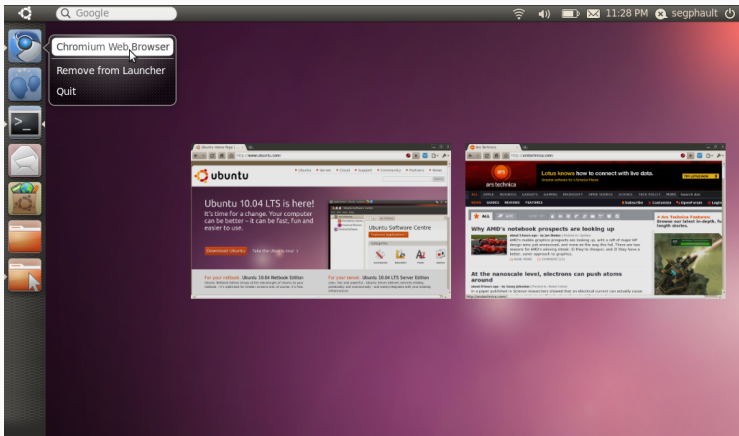




- The Linux **kernel**
- A collection of **GNU utilities**
- Graphical software & desktop environment
- Package managers







37

As in free beer and free speech.

<http://www.ubuntu.com/download/desktop>

Linux at Heriot-Watt University

- Access University files
- Move files between personal laptops and University
- Run code on University machines
- Remote logins
 - Command line: `ssh` through the SSH gateway
- Remote file access
 - Graphical/command line: FTP
 - Command line: `scp` through the SSH gateway

<https://www.macs.hw.ac.uk/cs/faq.html>

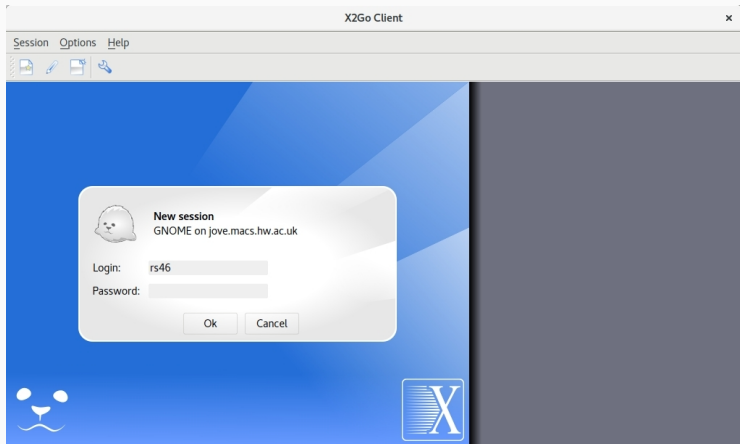
Logging into jove Linux server remotely

```
ssh -ocontrolmaster=yes \  
-J user@sshgw.hw.ac.uk:44788 \  
user@hw-em250-lx08.macs.hw.ac.uk
```

<https://www.macs.hw.ac.uk/cs/faq.html#Qm4>
Install multi-factor authentication app.

Logging into a Windows computer remotely from Linux

```
xfreerdp /g:gate-uk.hw.ac.uk \  
        /gu:USERNAME /gd:hw \  
        /gt:rpc /sec:nla /u:USERNAME \  
        /d:hw /v:HW-EMG46-PC001 /cert-ignore /f
```



- <https://wiki.x2go.org>
- <http://www.macs.hw.ac.uk/cs/faq.html#Qnx>
- <https://www.dropbox.com/s/7nf52oqv4sp5k0y/User%20guide%20-%20sshgw.docx?dl=0>

SIMPLY EXPLAINED

greek&poke

`budget_estimation_final_v1.1-ow.xlsx`

OR

`budget_estimation_last_version_2.xlsx`

OR

`budget_estimation_2012_10_25_ready_new.xlsx ?`



NO IDEA

VERSION CONTROL



And finally....

Navigate Dr Hans-Wolfgang Loidl's Linux tutorial

<http://www.macs.hw.ac.uk/~hwloidl/Courses/LinuxIntro/>

1. Watch screencasts
2. "working material for HaWo's Linux Introduction here"
3. Read "*Basic Linux Usage*"
 - *Some Exercises* → *Basic Exercises*
4. Read "*Basic Shell Scripting Using bash*"

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