

## BitTorrent (a CAIA “Data Dump” talk)

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## Who am I

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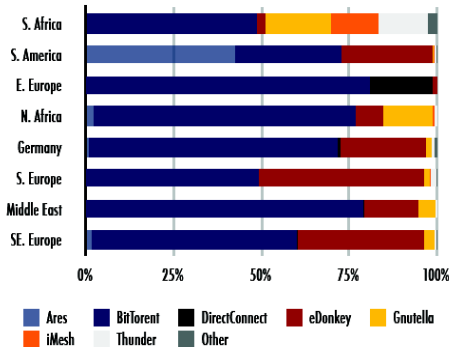
- History
  - Comalco Smelting Tasmania (Yes, the real world) – Electrical Engineer
  - Monash University – Network Engineer → Research → Teaching
  - PhD (Monash University, 2004) – Copyright protection of Streaming Video
  - Swinburne University – Research → Research + Teaching
- Research Interests
  - Data Networking
  - Performance of Networked Applications
  - Practical – real systems over simulations
  - More recently – BitTorrent
- <http://caia.swin.edu.au/cv/jbut>



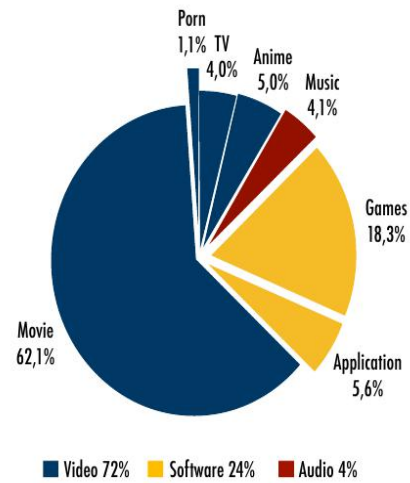
## Ipoque Internet Study

Most popular P2P protocols

Protocol	Southern Africa	South America	Eastern Europe	Northern Africa	Germany	Southern Europe	Middle East	South-western Europe
All P2P	65,77%	65,21%	69,95%	42,51%	52,79%	55,12%	44,77%	54,46%
Ares	0,29%	42,63%	0,00%	2,24%	0,84%	0,16%	0,11%	1,80%
BitTorrent	48,34%	30,02%	80,83%	74,51%	70,77%	48,94%	78,85%	58,20%
DirectConnect	0,01%	0,00%	17,87%	0,08%	0,85%	0,00%	0,12%	0,30%
eDonkey	2,48%	25,99%	1,16%	7,70%	24,22%	47,17%	15,37%	35,99%
Gnutella	18,60%	0,36%	0,14%	14,21%	1,75%	1,66%	5,00%	2,75%
iMesh	13,60%	0,02%	0,00%	0,47%	0,00%	0,03%	0,00%	0,14%
Thunder	14,04%	0,80%	0,00%	0,69%	0,77%	1,64%	0,52%	0,62%
Other	2,64%	0,19%	0,00%	0,10%	0,68%	0,41%	0,03%	0,21%



## What is BitTorrent used for?



- Traffic Management
- Copyright Issues



# Traffic Classification

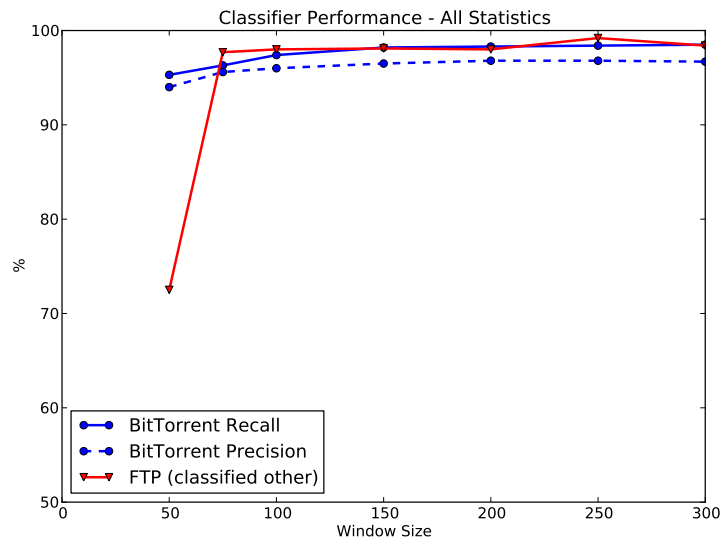


- CAIA pioneered the use of sub-flows for real-time Traffic Classification
- Flows are divided into sub-flows
- A Machine Learning system is trained to classify sub-flows into known types
- The output of the classifier tells us the flow class
- As flows are continuously classified, we get a form of real-time classification during the flows lifetime





- Ratio of packets that have 5 or 17 byte payload
- Ratio of packets whose payload is smaller than 40 bytes
- Ratio of packets whose payload is larger than 1350 bytes
- Smaller of the standard deviation of uni-directional packet payload sizes

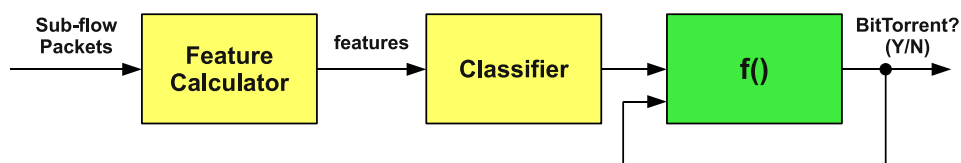


## Future Research



### Using Classifier Feedback

- Sub-flow classification is stateless
- We have one more piece of information – the classification of the previous sub-flow(s) from this flow

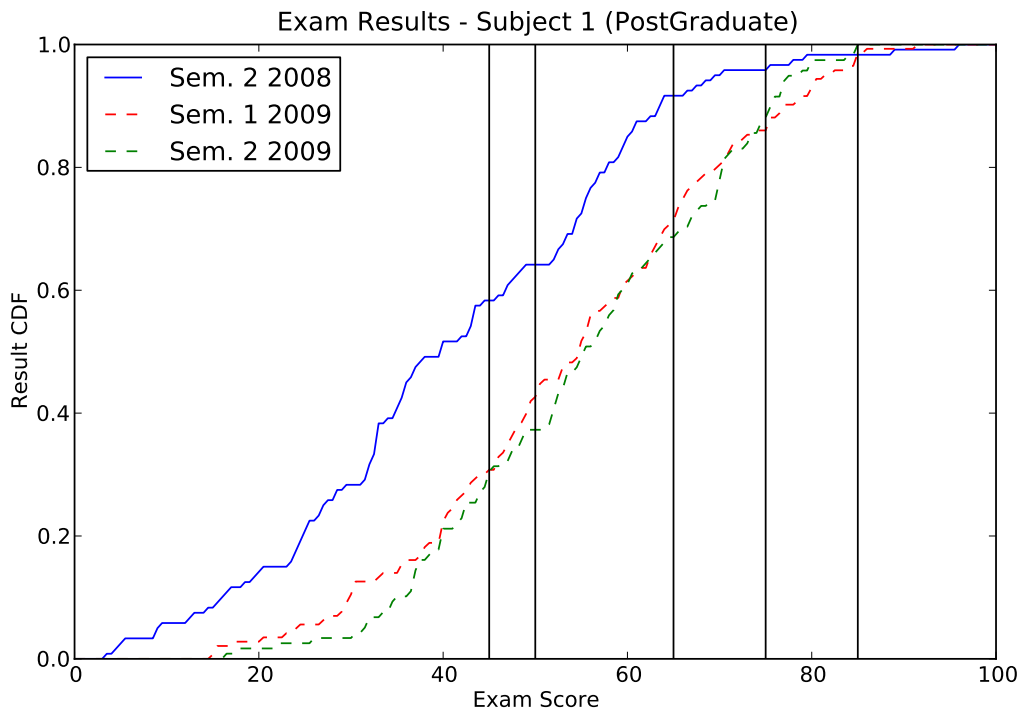


### Other BitTorrent Clients

- Encrypted BitTorrent
- BitTorrent over a UDP carrier



- Does Lectopia impact on student performance?



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