Research?

• what is it?
• should you be doing it?
• how do you do it?
Definitions of research

“Systematic investigation towards increasing the sum of knowledge”
(Chambers 20th Century Dictionary)

“an endeavour to discover new or collate old facts etc. by the scientific study of a subject or by a course of critical investigation.”
(The Concise Oxford Dictionary)
Types of research

• the scientist
• the social scientist
• the historian
• the journalist

? R & D
The project

• integrative
• independent
• interesting
• intellectually challenging

? innovative
   not necessary but good
it is wise to learn from your own mistakes

it is shrewd to learn from other people’s mistakes
Other people’s work

• what they write
  books, articles, manuals

• what they say
  interviews, discussion

• what they make
  software, organisations
Finding references

- keyword searches
- backward: bibliographies
- forward: citation indexes
- what’s available
Filtering references

be selective!

- keywords  (unreliable)
- abstracts
- skim read
- citation count
Recording references

what
- details (title etc.)
- keywords (your own)
- mini abstract
- key points

where
- card index
- word processor file
- standard database
- bibliographic db
Talking to people – who

- client
- supervisor
- other staff
- friends and contacts
Talking to people – what

• you don’t know what you’re doing

professional — does it
academic — knows about it
Artefacts

Embody

Experience

things people make
• what is good about it?  
  why is it good?

• what is bad about it?  
  why is it bad?

• why do it this way?
Artefacts

Embody

Theories

e.g., mouse ⇒ hand/eye control better than typing
deep understanding helps

• combine ideas
  avoid the crocaphants

• change context
  e.g., interfaces for the blind

• improve and correct
Artefacts

Embody

Assumptions

solutions depend on context

e.g., speed vs. space for algorithms
Your own work

previous work → analysis

the product

your ideas

what next

critique
Analyse existing work

- classify
- taxonomise
- multiple perspectives
- matrices
Understand your context

<table>
<thead>
<tr>
<th>non preemptive</th>
<th>single processor</th>
<th>multi-processor</th>
</tr>
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<tbody>
<tr>
<td>preemptive</td>
<td>(a) or other</td>
<td>somat else</td>
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matching solution?
- yes — then use it
- no — synthesise
Planning for innovation

?

literature review → bright ideas → novel solution

Don’t rely on it!

ideas
Finding new ideas

- abstraction
- analogy
- lateral thinking
- challenge yourself
- silly ideas

e.g., the munchman interface
Evaluation

• testing
• simulation
• proof
• statistical
• anecdotal
Critique – the good

good points

• say what they are!
• what is novel, interesting?
• how does it relate to theory?
Critique – the bad
what is wrong and why

• resource limitations
• ran out of time
• lack of experience
• hindsight