The Researchers
Bible

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1 What is a Thesis?

- To get a Ph.D. or M.Phil. You must write a thesis and sit an oral examination.
Procedure for thesis proposal at INAOE

- January to May: Contact INAOE research groups.
- Summer: You must have the name of the consultant or consultants.
- In the first week of May is due the format of the thesis proposal.
- Two months before the exam date request must be done examining jury request
Test Protocol

- Presented with formal wear at least a half hour before the test
- Verify that has the equipment necessary for the defense
- Verify that jury and consultants arrive on time
- Ask the viewer academic review that everything is in order
2. The Programme of M.Phil. Study at INAOE

- Requirements for permanence
  - Being a full time student.
  - Pass all subjects taken.
  - Maintain a minimum average of 8.0 in each of the academic periods.
  - Complete the program within a maximum of 24 months
The Programme of M.Phil. Study at INAOE

- Graduation Requirements
  - Covering 80 credits with a minimum GPA of 8.0.
  - Perform a thesis project supported by the corresponding Academy, under the guidance of a supervisor.
  - TOEFL (500 points).
  - Not having any debt with the INAOE.
  - Defender and approve the thesis on front of a jury appointed by the Academy.
3. Estandar Pitfalls for Postgraduate Students

- Solving de world
- Manna from heaven
  - Read the literature
  - Talk to people
  - Tackle a simplified problem
  - Write the ideas
- Computer Bum
- Yet another language
Estandar Pitfalls for Postgraduate Students

- Micawberism (Experiments)
  - Talk to people.
  - Imagine the experiment finished

- Ivory tower
  - Do not forget the rest of the world

- Misunderstood Genius

- Lost in abstraction

- Ambitious paralysis

- Methodology does not make a thesis
Questions
4 Psychological Hurdles
Difficulties and Antidotes
4.1 Mental Attitude

- Appropriate mental
  - Belief in what you are doing
  - Little egoism VS Arrogance
4.2 Research impotence

- Lack of success at research
  - Inadequacy
  - Impotence

- Doubts of ability
  - Dedication and enthusiasm evaporates

- Not magic / Skill
4.3 Dealing with criticism

- Seek out and take it into account
- Valid VS Invalid
- Invalid? Missunderstanding?
- Take knocks
4.4 Early morning – Cold Start

- Difficult to start working (everyday)

- Remedy
  1. Regular working schedule
  2. Attractive class to ask to do first thing
4.5 Theorem Envy

- Only probe theorems if are relevant

4.6 Fear of Exposure

- Great ideas not explored
5 Choosing a Research Project

Criteria to choose proyect
Criteria

- Enthusiasm
  - Problem of central importance
  - Proven abilities

- Worthy of a PhD

- Do-able 3 years

- Supervisor available
  - Interest in the area
  - Projects suggestion
- General area – specific topic
- Supervisor
  - Suggestions
  - Advice
    - Worthiness
    - Do-ability
    - Reading material
      - Future Work
Components of creativity

- **Expertise**: knowledge-technical, procedural and intellectual
- **Creative thinking skills**: How flexibly and imaginatively people approach problems
- **Motivation**: Intrinsic is more effective than extrinsic
6 Research Methodology

Many possible but you should have one
Different Methodologies

- Checklist approach
  - List of criteria

- Scoring Methods
  - Weighted criteria

- Benefit-Cost Analysis

- Mathematical programming methods

- Simulation Models
Example of methodology

- Stage 1
  - Think of a scenario

- Stage 2
  - Hypothesize processes to achieve the scenario
    - Procedures
    - Data structures

- Stage 3
  - Think further scenarios

- Stage 4
  - Choose programming language
Stage 5
- Find new examples, make it robust

Stage 6
- Test on new examples

Stage 7
- Describe
- Draw out new techniques
- Compare
Questions
Writing is not a talent reserved for a select few, it is a skill that can be learned.
7 Writing Papers

- They are very important and you should expect to devote a large part of your research career to writing them.

- Writing papers is the main way of communication with the rest of the AI world and it is also a good vehicle for clarifying and debugging your ideas.
- Departamental research papers
  - Journal, conference or book

- Departamental teaching papers
  - Lectures notes

- Departamental software papers
  - Manual and editing facilities

- Departamental discussion papers
  - Internal circulation and discussion

- Departamental working papers
  - Descriptions of research work, either finished or in progress

- Publishing papers
  - Each paper must be approved by your supervisor before it is published internally.

- Conference proceedings
  - A laisser form publication is the proceeding of a conference. Work in progress.
8 Guide to writing

- During the course of your research project you will need to write many documents.
  - Thesis
  - Research notes
  - Records of papers to read
- Your paper should have a message
- Make sure that the key ideas are stated transparently
- Do not try to say too much in one paper.
- Start by describing the central idea.
- Use worked examples to illustrate the description of a procedure.
- You can write your thesis top-down, bottom-up, or bi-directionally.
- The thesis message is short and easy to edit.
- Now you can go back to bottom up activity.
Suggested below is a guide to organized writing

1. INTRODUCTION - OPENING PARAGRAPH
   a. Begin with a general statement.
   b. Narrow it down to the controlling idea (for thesis statement).

2. BODY - THREE DEVELOPING PARAGRAPHS
   In each paragraph:
   a. Use transitions (repetition of key words and ideas) to connect paragraphs together.
   b. Develop the topic sentence with details, definitions, illustrations, comparisons, and contrasts.
   c. Conclude the paragraph with a summary of the main idea.

3. CONCLUSION - FINISHING PARAGRAPH
   a. Restate the thesis.
   b. End with a general statement finalizing the discussion.
9 Guide to reading

- Staying in touch with related research is one of the main subgoals of obtaining a Ph.D.

- Reading is difficult: The difficulty seems to depend on the stage of academic development. Initially, it is hard to know what to read (many documents are unpublished), later reading becomes seductive and is used as an excuse to avoid research. Finally, one lacks the time and patience to keep up with reading.
- **Outer circle**
  - You can achieve an appropriate level of familiarity with the work in this circle by skimming papers or reading the abstracts.

- **Middle circle**
  - Here you need to spend some more time. You will want to read some more specialized textbooks and attend seminars, etc.

- **Inner circle**
  - For a really deep understanding, reading a paper once is not sufficient. You should read it several times and get involved in it.
10 The examination of Theses

- When you have written and rewritten your thesis to your supervisors satisfaction then you are ready to submit.

- Your supervisor and head of department will choose suitable internal and external examiners.
References

- Manual de procedimientos para estudiantes de postgrado 2012. Dirección de formación académica, INAOE


Questions
Thanks!