

Faculty of Medicine, Dentistry, Nursing and Pharmacy
MEDICINE GRADUATE PROGRAMME

Thesis Meeting

Form 12: Thesis Meeting (30 Months)

Name: Roy Schestowitz

Supervisor: Chris Taylor

Date of meeting: March 14th, 2006

PROGRESS REPORT – to be filled in by the Student prior to the meeting, after consultation with the Supervisor and made available to Supervisor and Advisor prior to meeting.

(NB: This report is for the guidance of the Student in the planning of his/her thesis)

The project was set to investigate an innate relationship between two techniques, both of which have become rather fundamental in the field of computer vision. The first among these techniques is non-rigid registration (NRR), which is the method used to align two or more images into a common frame of reference, thereby annulling pose, shape, and lighting variations. This process simplifies subsequent analysis of groups of images. The latter technique is *modelling* of the appearance of imaged objects. Resultant models are used to learn groups of images, based on statistical analysis.

The achievements of the project can be summarised as follows:

Model-based registration

- Initial experiments which demonstrate method feasibility in 1-D
- Personal contribution to full implementation in 2- and 3-D

Assessment of models and NRR

- Generalisation and Specificity devised as means of comparing image sets
- Use of Euclidean image distance, the shuffle transform, among some alternatives
- Implementation of various efficiency improvements

Validation methodology and experiments

- Controlled perturbation framework
- Definition of sensitivity measure (figure of merit)
- Comparison with overlap-based methods
- Benchmark of different NRR algorithms (most notably pair-wise and group-wise)

Normalisation of the measures

Validation experiments in 3-D

- **Draft outline of thesis structure** (*continue on a separate sheet if required*): Draft to be submitted with report form, including detail of chapter headings.

See the enclosed document titled “Thesis Summary”. The document contains a detailed breakdown into sections, subsections, as well as prospective content for each.

- **Timetable for thesis writing:**

What follows is a breakdown into a set of milestones. These milestones correspond to completion of individual chapters:

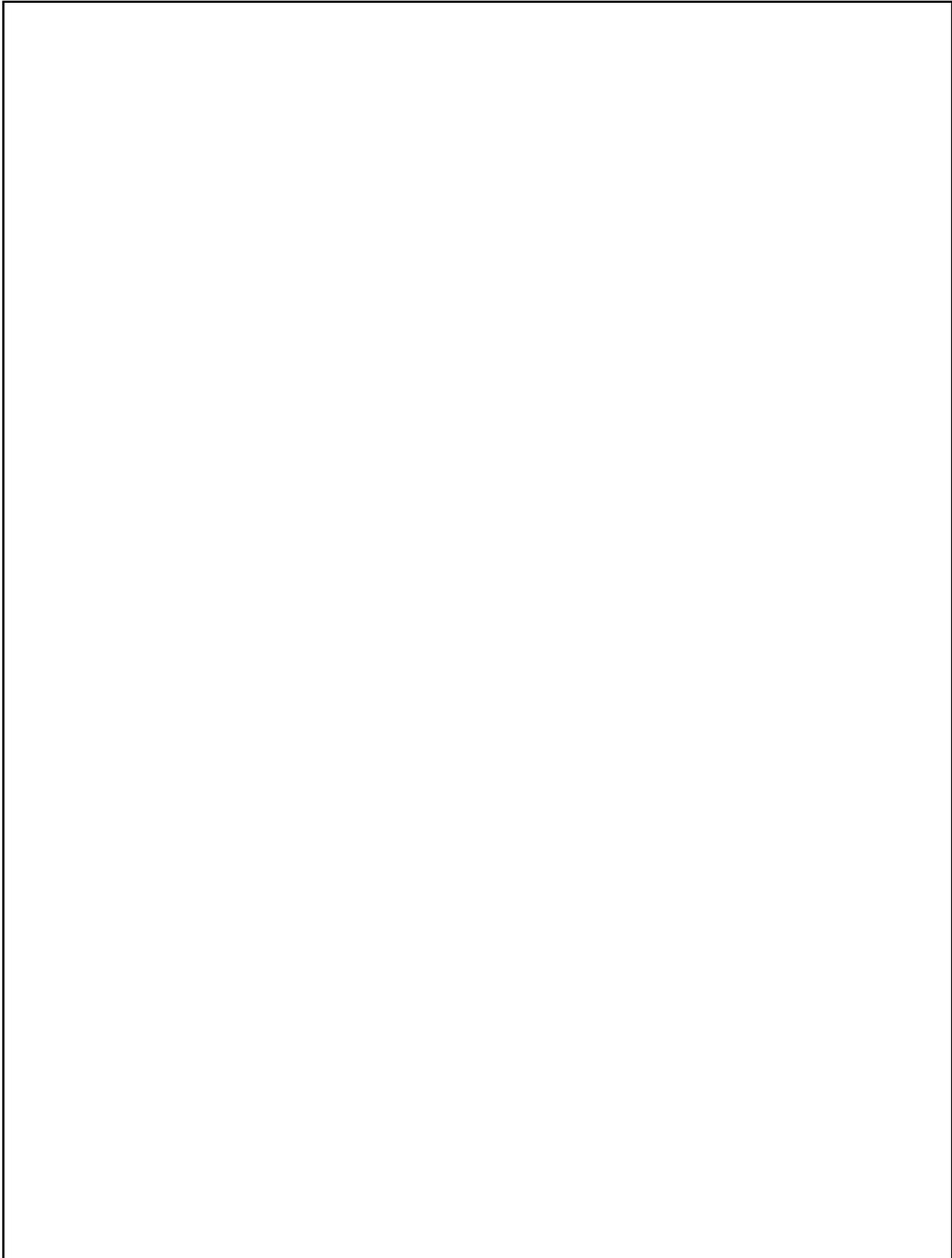
- **Introduction** – to be completed by the end of April 2006
- **Background** – to be completed by the end of May 2006
- **Methods** – to be completed by mid-June 2006
- **Experiments** – this set of chapters will form the most considerable portion of the thesis and should thus require at least a month to complete. It is safe to set a deadline at the end of July.
- **Summary and Conclusions** – to be completed by mid-August
- **Appendices, inclusion of videos (on an accompanying CD-ROM), and a 'final touch'** – to be completed by the end of August

- **Timetable for completion of remaining work:**

Work on remaining goals will be done in parallel to composition of the early chapters. The intent is to finish every planned experiment before the chapter on Experiments is reached.

The experiments which are scheduled to be run and then analysed are:

- Assessment of NRR in three dimensions. This includes a comparison of a variety of algorithms. This strand of the work already has the necessary code in place, yet it requires a great deal of processing time. This should not, however, interfere with the write-up period since little human intervention is required.
- Further investigation of measure normalisation
- Optimisation of the existing methodology using *ad hoc* techniques. While several options have been proposed and outlined, their practical use has not been investigated yet.





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It is also important that a record is kept of your attendance at the units listed below. Please tick accordingly. Records of attendance will be held in the Graduate Office.

Description	Attended
Workshops	
Year 3 Workshop (Your thesis and beyond)	X
Symposia/ Meetings	
Graduate Student Presentation or local symposia	✓
MIAS-IRC plenary meeting, Oxford	✓
MIAS-IRC plenary meeting, Manchester	✓
Seminars	
Thesis writing seminar	✓
Structure and Function plenary meeting, UCL	✓

Ph.D. Workshop	✓
EPSRC Summer School, Surrey	✓
Structure and Function workshop, Gordon Museum, London	✓
MIUA Summer School, Imperial College London	✓
MIAS-IRC plenary meeting, UCL	✓
MIAS-IRC plenary meeting, Manchester	✓
MIAS-IRC plenary meeting, UCL	✓
2 nd Year Ph.D. Workshop	✓
MIAS-IRC plenary meeting, Oxford	✓
Structure and Function plenary meeting, Oxford	✓
MIAS-IRC plenary meeting, Manchester	✓
IRC-PET Meeting, Manchester	✓

Signature of Supervisor..... **Date**

Signature of Advisor..... **Date**

Declaration by Student:

I have discussed my progress with the Advisor and my Supervisor and have read and agreed with the comments made above.

Signature of Student **Date**

Don't forget to send a copy to the Graduate Tutor/Education Office

Photocopy or download further copies of this form when required