UNIVERSITY OF BIRMINGHAM
Electronic, Electrical and Systems Engineering

9 MONTH PROGRESS REPORT
Review Meeting

Name of Student:	MIGUEL PEREZ-XOCHICALE	Reg No: 1386479
Date of Meeting:		

PLEASE GIVE VERY BRIEF COMMENTS ON MEETING:

A short presentation on work which was completed after 9 month report.
Questions were raised over whether periodicity and the stationary signal assumptions ~~are~~ can be addressed. Also, whether the nature of the signals (and attractors) are explained. Make sure you understand and can explain mathematical terms. Justify why Takens is the appropriate model for this work.

Development Needs Discussed and Planned. Brief list of training/courses to be taken and those completed.	

PLEASE INDICATE OUTCOME OF MEETING BY TICKING APPROPRIATE BOX

☑ Progress is satisfactory continue with work for PhD/Msc by Research submission, expected submission date:..................

☐ Progress unsatisfactory – refer to EESE School Postgraduate Progress Panel the panel will arrive at one of three recommendations: **(i)** Withdraw **(ii)** Transfer to MSc by research and produce a revised workplan to submission or **(iii)** The student will perform an additional set of agreed tasks, report back to the panel, which will review this submission and reach a decision to recommend that the PhD student, proceeds to PhD, transfers to MSc by research, or withdraws; this decision will be reached before the end of the first year of full-time registration

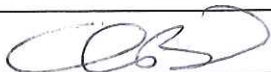| Signature of Student:	
Signature of Supervisor:	
Signature of Independent Assessor:	
Signature of Dr H Ghafouri-Shiraz Postgraduate Research Programme Manager	

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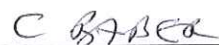| 9 MONTH PROGRESS REPORT	
Name of Student:	MIGUEL PEREZ-XOCHICALE
Reg No:	**1386479**
Title of Project:	Chaos Theory Approach to Human Activity Recognition Using Inertial Sensors
Supervisor:	CB/NC Acad Advisor: MJR
Start Date of Research Programme:	03/11/2014
Date Report Submitted:	7th August 2015
Development Needs Discussed & Planned	

Supervisor's/Academic Advisor's Comments

The derivation and explanation of the time-series analysis is presented using artificial data (rather than sensor data). This helps with the analysis but the artificiality loses the very basis of time-series; you are just looking at a sinusoidal waveform, so there is little need for the sophisticated analysis you propose.

It would be useful to compare your approach with alternatives. Good progress so far and the work continues to raise some intriguing questions.

Name: CB   Signature: C BABER   Date: 15/10/2015

Dr H Ghafouri-Shiraz
Postgraduate Research Programme Manager   Seen - Signed: ...H.G.S.... Date: ....

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9 MONTH PROGRESS REPORT

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Supervisor's/Academic Advisor's Comments

A well written report.

You need to be clear in the research questions (question 3) and whether you are designing a state of art recogniser or assuming that all activity data relates to the dance activity and that you are interested in modelling expertise (penultimate paragraph 1.1).

You have made good progress in minimal TDE parameter estimation (section 3). You may need to address at some point the effect of parameter variation on expertise modelling.

In artificial signals, be clear of their purpose. Are they to observe the effect of parameter changes in the TDE as a separate evaluation exercise or are you planning to add noise to real data in a controlled way for evaluation?

The publication plan is on track – a CHI paper has been submitted since the report.

Name: Neil Cooke	Signature:	Date: 08/10/2015

Dr H Ghafouri-Shiraz
Postgraduate Research Programme Manager   Seen - Signed: ...........M.G.Sh............. Date: 15/10/2015

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Academic Advisor's Comments

This is a good 9 month report. It is authoritative, well-structured and mainly well-written. There are some grammatical errors but the meaning is clear. I note that the report title is not the same as the "title of project" above, but based on what I have read the report title seems to be more appropriate.

The literature review appears to be good, though this is not my area of research.

The report shows that real progress has been made during the first 9 months of the project, in that an experiment is described and its results are presented. A paper was submitted ISWC 2016 (what does ISWC stand for?) but rejected, but the student seems to have learnt useful lessons from the reviewer's comments.

The focus of the research is an analysis of human behaviour using non-linear analysis. Specifically the report describes an experiment in non-linear analysis of dance movement based on the outputs of sensors attached to the dancers' bodies. The objective is to classify dexterity in dance. The method used is "time-delay embedding" (TDE). In my opinion the report would benefit from more information about this technique, including an intuitive description of what it does and an explanation of why it is particularly appropriate for the current application. The underlying assumption appears to be that the data can be represented as a hidden sequence on an unknown manifold M, and the objective of TDE is to reconstruct an approximation to the sequence and manifold. The sequence of steps in TDE is explained and illustrated, but there is no intuitive explanation of why it works.

There are some problems with some of the equations, some of which are confusing (equations (4) and (5)), or contain terms on the left-hand-side that depend on a variable that doesn't appear on the right-hand-side (equation (1)).

It would also help if some of the technical terms were defined. For example "being $x(t)$measurable" in section 3.

The axes of all graphs need to be labelled (e.g. Fig. 2).

Overall, though, this is a very good report describing some very interesting work, and I look forward to seeing how it develops.

Name: MJR	**Signature:**	**Date:**

Dr H Ghafouri-Shiraz
Postgraduate Research Programme Manager   Seen - Signed: ……...….................……. Date: ………………..