



**New Zealand Postgraduate Study
Abroad Awards (NZPSAA)**



Funded by the New Zealand Government - Administered by Education New Zealand

Application Form

Part 1: Student information	
Family Name	Hernandez
First Name/s	Sergio
Postal address	School of Mathematics, Statistics and Computer Science Cotton Building, Room 358 Gate 7 Victoria University Kelburn Parade Wellington New Zealand
E-mail and telephone	sergio@mcs.vuw.ac.nz
Institution	Victoria University of Wellington
Student ID	300116943
Department and/or Programme	Computer Science
Degree for which you are studying	PhD
Previous degrees and institutions	1. Master in Information Technologies, Universidad de Santiago de Chile.
	2. Civil Acoustic Engineer, Universidad Tecnologica de Chile.
	3.
	4.
Current year of study and anticipated completion date	2 year PhD student, ending in 2009.
Scholarships currently held	1. VUW-Conicyt PhD Scholarship.
	2.
	3.
Proposed destination country	Chile

Part 2: Research Proposal
Please complete the table below, and then attach up to two additional pages detailing your proposed research. (Note that you must provide your referees with a copy of this detailed research proposal, in addition to your application, when you request the reference.)

Brief title of proposed research ¹	Spatial and Temporal Sensory Processing
Brief description of research	<p>Biological sensory information is processed seamlessly by large receptive fields in the brain. The concept of neural assemblies has been established in the early works of Sherrington [Sherrington41] and Hebb [Hebb48]. The overall idea is to derive interactive neural maps that are able to process higher level of complexity compared to single spiking neurons. The sequential properties of neural populations has been studied by Gerstein[Gerstein83], and the statistical analysis of point processes demonstrated to be a valuable tool for measuring such complexity. More recently, Barbieri[Barbieri07] and Brown [Brown04] have used Sequential Monte Carlo methods to model the plasticity and the dynamical behaviour of receptive fields using state space models and the Bayesian filtering theory. Such complexity is hardly achieved in robotic sensors, where the problem has to be divided in several sub problems that can be loosely coupled between each other.</p> <p>The proposed approach for spatial and temporal sensory processing is based on a probabilistic graphical model that captures the temporal behaviour of the observed environment by means of birth-death point processes with spatial interactions. This model is able to simulate different realizations of a target distribution, enhancing diversity and at the same time controlling degeneracy of the system. The overall goal of the project is to build a unifying framework for spatial and temporal sensory processing that is able to detect events in low observable environments.</p>
Anticipated length of time abroad	45 days.
How will the proposed research/conference attendance/workshop etc contribute to your degree?	<p>PSIVT Conference (17-19 December) We'll be presenting a full paper with the proposed approach and describing some applications in image analysis.</p> <p>Valparaiso Neuroscience Institute (3-14 December) Visiting neuroscience research institute in Valparaiso.</p>
Why does the proposed research need to be carried in the country indicated?	Visit Dr. Domingo Mery for collaboration in the

¹ **If submitting an application for conference attendance, please use this section to explain the research you will be presenting.**

	<p>project "Identification and recognition of hydrological and geophysical phenomena with applications to landmine detection".</p> <p>Visit Dr. Adrian Palacios and participate of the following Complex Systems Institute activities :</p> <ul style="list-style-type: none"> • Dynamic stochastic systems in biology. • Systems biology. • Theoretical mathematical biology.
--	---

Part 3: Expenses

Please complete the attached table, listing anticipated expenses for your proposed research abroad. (Please note that funding is for expenses incurred by the student only, and not by accompanying dependants.)

Part 4: References

Please submit two confidential letters of reference with your application. Complete the top section of the referee forms and give them to two referees, along with a copy of your completed application form and supporting detailed description of proposed research. Ask the referees to return their references to you in a sealed envelope, **with their signature across the seal.**

Please provide the name, title, address, phone number and email address for your two referees, one of whom must be your current thesis/dissertation director.

Referee 1:	Referee 2:
------------	------------

Declaration:
I declare that the information contained in and provided in connection with this application is true and correct. **I acknowledge that giving false or misleading information is a serious offence.**

Signature:	Date:
-------------------	--------------

- Checklist of documents for submission**
- Completed application form including budget
 - Attachment detailing proposed research (two pages maximum)
 - 2 letters of reference (if not sent direct, then in sealed envelopes, signed across the seal)
 - Academic transcripts (undergraduate and postgraduate to date). Please note that copies will only be accepted if they have been officially certified.
 - curriculum vitae (optional—include if it contains any additional information relevant to your

proposed research abroad)

Please submit your application to the ENZ Scholarships Manager no later than 20 May or 20 November each year

Candidates shall submit applications directly to the following address:

Scholarships Manager
Education New Zealand
PO Box 10-500
Wellington.

Phone: +64 4 917 0872
E-mail: Scholarships@educationnz.org.nz
Web: www.newzealandeducated.com/scholarships

New Zealand Postgraduate Study Abroad Awards

Funded by the New Zealand Government - Administered by Education New Zealand

Letter of Reference

To the student:

Please fill in the information in the two boxes below and present this form to two referees, with a copy of your application form and detailed description of your proposed research attached.

Student
Name:
Institution:
Department:
Proposed research:

Referee
Name:
Institution:
Department and Title:
Role in student's research programme:

To the Referee:

Thank you for providing this student with a letter of reference as part of the application for the New Zealand Postgraduate Study Abroad Award. The student named above should have provided you with a copy of their completed application form, including an attachment detailing their proposed research. Please do not provide a letter of reference if you have not seen these documents.

The New Zealand Postgraduate Study Abroad Awards have been introduced by the Government to assist New Zealand postgraduate degree students to gain short-term access to the world's top research facilities, institutions, and resources, and to participate in international meetings, seminars, and workshops in their field of research. The awards are part of a funding package whose objectives include raising the international profile and reputation of New Zealand education, and increasing the research capability and output of New Zealand tertiary institutions.

Please attach a letter of reference to this page which addresses the student's proposed research as presented on the application form, and answers the following questions:

- How essential is the proposed study or research abroad to the student's degree programme?
- Is this a strong research proposal, and does the time-frame seem reasonable?
- What is your assessment of the student's academic merits and strengths?
- Are you confident that the student has the maturity and independence to make full use of the opportunities abroad, to complete the research as proposed, and to represent New Zealand positively?

Signature	
My signature below indicates that I have seen a copy of the application form and detailed description of proposed research abroad for the student named above and have evaluated the student in relation to the proposed research.	
Name:	Date:

Please attach your letter of reference to this form and enclose in a sealed envelope. Please sign across the seal of the envelope and return to the Education New Zealand Scholarships Manager: PO Box 10-500, Wellington, New Zealand. Please note that e-mailed references cannot be accepted.

Should you have any questions surrounding the awards, please e-mail scholarships@educationnz.org.nz.

The information in this Letter of Reference will be used only in the selection of Study Abroad Award recipients, and will remain confidential to Education New Zealand and the appointed selection committee.

NZPSAA Application – Part 3: Expenses

Funds required for offshore study

	NZ\$
Registration fees (if applicable)	
Travel	
Living expenses (meals, accommodation, telephone etc)	
Travel insurance	
Extra tuition fees	
Laboratory fees	
Research costs (incl. books)	
Subtotal	
Total funds required	

Funds Obtained from other sources

Details	Source	\$\$ Applied for	\$\$ Confirmed already
Savings			
Scholarships and Prizes (Attach extra sheet if necessary)			
Institutional Funding (from home institution)			
Loan (from family/bank etc)			
Other			
Total Confirmed			
Funds Required (carried over from above)			
Shortfall = funds required less total funds confirmed			