

X Latin American Summer School on Computational Intelligence, Santiago, Chile.

December 15-18, 2014.

Organizing Committee

- **Chair: Doris Sáez, Universidad de Chile**
- **Co-chair: Gonzalo Acuña, Universidad de Santiago de Chile**
- **Honorary Chair: Pablo Estévez, Universidad de Chile**
- **Program Chair: Claudio Held, Universidad de Chile**
- **Tutorials: Richard Weber, Universidad de Chile**
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- **Poster Competition Chair: Pablo Zegers, Universidad de los Andes**
José Delpiano, Universidad de los Andes
- **Publicity: Millaray Curilem, Universidad de la Frontera**
Jorge Silva, Universidad de Chile

January 06, 2015

The Chilean Chapter of the IEEE Computational Intelligence Society organized the X Latin American Summer School on Computational Intelligence (Escuela de Verano de Inteligencia Computacional: EVIC2014). Summer Schools on Computational Intelligence have been organized since 2003 and have demonstrated to be an important opportunity to learn, exchange views and update their knowledge for senior undergraduate and graduate students, researchers and professionals, interested in knowing and applying Neural Networks, Fuzzy Logic, Evolutionary Computation and other Computational Intelligence techniques. This year, EVIC 2014 took place in Santiago, at the Universidad de Chile, and it continued the tradition, offering an attractive program for its target audience. Particularly, this time we had a special session for professionals, entrepreneurs and innovators who wanted to learn and/or strengthen their knowledge in applications related to Energy.

Computational Intelligence puts together a set of biologically inspired techniques to address complex engineering problems, such as Intelligent Control, Robotics, Optimization, Pattern Recognition, Prediction and others. The great advantage of these techniques is not only that they have demonstrated excellent results but mostly because

of their flexibility to adapt to a wide variety of problems, from medicine to astronomy, through virtually all knowledge areas. For this reason it is important that students know about their progress and applications in order to encourage their study. The aim of the EVIC2014 Summer School was to promote Computational Intelligence and to disseminate the latest results of research and development of this interesting area, especially among graduate students and faculty members from Chile and other Latin American countries.

The Summer School also included a student Poster Competition.

Program

The program was structured as follows:

1. Plenary Sessions

The plenary talks of EVIC 2014 were presented English.

- **P1:** *Learning in Non-Stationary Environments.*
Speaker: Dr. Cesare Alippi, Politecnico di Milano, Milano, Italia.
- **P2:** *Intelligent Embedded Systems*
Speaker: Dr. Cesare Alippi, Politecnico di Milano, Milano, Italia.
- **P3:** *Computational Intelligence Challenges and Applications to Astronomy in the Big Data Era*
Speaker: Dr. Pablo Estévez, Universidad de Chile, Chile
- **P4:** *From ADP to the Mammal Brain and Beyond: Foundations, Roadmap, Challenges and New Options for Quantum Neural Nets*
Speaker: Dr. Paul Werbos, National Science Foundation, USA
- **P5:** *How Latin America Could Save the World by Changing the Game on Renewable Energy*
Speaker: Dr. Paul Werbos, National Science Foundation, USA
- **P6:** *Economics of Renewables: Finding the Optimal Degree of Integration into the Area Power System, Intervention and Control*
Speaker: Dra. Ludmilla Werbos, University of Memphis, USA.
- **P7:** *Sensing Room Occupancy Distributions for Smart Lighting Applications*
Speaker: Dr. Kim Boyer, Rensselaer Polytechnic Institute, Troy, NY, USA.
- **P8:** *Transient spatio-temporal dynamics as Modus Operandi of large-scale networks*
Speaker: Dr. Robert Kozma, University of Memphis, USA
- **P9:** *Solar Energy Challenges in Chile*
Speaker: Dr. Rodrigo Palma Behnke, Universidad de Chile, Chile

2. Tutorial Sessions

National and international experts presented tutorials on topics related to their expertise areas. The Spanish speaking speakers presented in Spanish, the others in English.

- **T1:** *Support Vector Machines for Modeling of Dynamic Systems*
Speaker: Dra. Millaray Curilem, Universidad de la Frontera, Chile.
- **T2:** *Efficient Algorithms for Learning Support Vector Models*
Speaker: Dr. Ricardo Ñanculef, Universidad Técnica Federico Santa María, Chile.
- **T3:** *Support Vector Machines in High Dimensionality and Class Imbalance Conditions*
Speaker: Dr. Sebastián Maldonado, Universidad de los Andes, Chile.
- **T4:** *Statistical Methods and Signal Processing Applied to the Reconstruction of Geological Patterns*
Speakers: Dr. Julián Ortiz, Dr. Jorge Silva, Universidad de Chile and Dr. Milan Derpich, Universidad Técnica Federico Santa María, Chile.
- **T5:** *Time-Frequency Analysis using Information Theory and Matrix Factorization*
Speaker: Dr. Pablo Huijse, Universidad de Chile, Chile.
- **T6:** *Approximate Bayesian Inference*
Speaker: Dr. Karim Pichara, Pontificia Universidad Católica de Chile, Chile.
- **T7:** *Computational Intelligence in the Age of Big Data to Improve Profitability Indicators in Business*
Speaker: Cristian Figueroa, Universidad de Chile, Chile.
- **T8:** *Computational Intelligence in Gene Regulation Networks Modeling*
Speaker: Dr. Gonzalo Ruz, Universidad Adolfo Ibañez, Chile.
- **T9:** *An introduction to Prognosis, Uncertainty Representation, and Risk Measures*
Speaker: Dr. Marcos Orchard, Universidad de Chile, Chile
- **T10:** *Deep Learning Machines*
Speaker: Dr. Pablo Zegers, Universidad de los Andes, Chile
- **T11:** *Introduction to Computational Intelligence and Data Mining*
Speaker: Dr. Richard Weber, Universidad de Chile, Chile
- **T12:** *Introduction to Fuzzy Logic, Theory and Applications*
Speaker: Dr. Claudio Held, Universidad de Chile, Chile
- **T13:** *Computational Intelligence Applications to Smart Grid*
Speaker: Dr. Djalma Falcão, Universidade Federal do Rio de Janeiro (UFRJ), Brasil.
- **T14:** *Intelligent System Applications to Power Systems and Smart Grids*
Speaker: Dr. Alexandre Rasi Aoki, Universidade Federal do Paraná, Brasil.
- **T15:** *Advanced Power Electronics technologies for grid applications*
Speaker: Dr. Alessandro Costabeber, University of Nottingham, UK.

3. Poster Competition

The aim of this competition was that students presented their research work, including applications of Computational Intelligence tools. Both undergraduate and graduate students were welcomed. Student authors presented their work in English to a jury (Dr. Cesare Alippi, Dr. Pablo Zegers and Dr. Claudio Held), who evaluated them.

The winners of the poster competition were:

Award	Authors	Title	Institution	Country
1st Place	<u>Andrea Colins</u> Z. Gerdtzen J. C. Salgado	Mathematical Modeling of Intestinal Iron Absorption Using Genetic Programming	Universidad de Chile	Chile
2nd Place	<u>Slavia Vojkovic</u> <u>Isabel Weber</u> Rodrigo Carrasco	Energy Management in a Microgrid Using Stochastic Programming and Data Clustering	Universidad Adolfo Ibañez	Chile
2nd Place	<u>Ledys Salazar</u> <u>Harvey Rosas</u> <u>Rodrigo Salas</u> <u>Víctor Morales</u>	A fuzzy clustering application to fishery identification techniques in Chile	Universidad de Valparaíso	Chile
3rd Place	<u>Gina Sierra</u> <u>Leonel Gutiérrez</u> <u>Antonio Bayas</u>	Application of the Genetic Algorithm and Particle Swarm Optimization to a MPC Strategy for a Continuous Stirred-Tank Reactor	Universidad de Chile	Chile

All authors are mentioned in the table above. The students among them are the underlined names.

A total of 16 posters were presented, coming from different institutions:

Institution	Country	Number
Universidad de Tarapacá	Chile	3
Universidad Adolfo Ibañez	Chile	1
Universidad de la Frontera.	Chile	1
Universidad de Chile	Chile	2
Pontificia Universidad Católica de Valparaíso	Chile	2
Universidad de Valparaíso	Chile	2
Universidad de Santiago de Chile	Chile	2
UNED – PUCV – EUROMAT/CIEMAT	España- Chile	2
Universidad Nacional de San Agustín, Arequipa	Perú	1
TOTAL		16

Participants:

The total attendance was 157, including lecturers and organizers.

Institution	N. of participants
CrossWave SpA	1
DUOC-UC	5
Endesa	3
National Science Foundation	1
NAVIGO MINING SPA	1
Politecnico di Milano	1
PUC	1
PUCV	5
Rensselaer Polytechnic Institute	1
Tecnet Chile S.A.	1
UFRO	7
Universidad Adolfo Ibañez	4
Universidad de Chile	77
Universidad de Concepción	7
Universidad de la Frontera	1
Universidad de La Serena	1
Universidad de Los Andes	2
Universidad de Santiago	15
Universidad de Tarapacá	5
Universidad de Valparaiso	4
Universidad Mayor	2
Universidad Nacional de San Agustín	3
Universidade Federal do Paraná	1
Universidade Federal do Rio de Janeiro	1
University of Memphis	2
University of Nottingham	1
UTFSM	4
Total	157

Participants per day

Day	Assistance per day
Monday 15 th	145
Tuesday 16 th	131
Wednesday 17 th	109
Thursday 18 th	106

We are satisfied about the organization achieved and the number of participants, particularly of students. We would like to thank the IEEE CIS and the Universidad de Chile for supporting the event. We also would like to thank all the professors and students whose participation made this version of EVIC possible.

Pictures



1. Organizing committee and international guests



2. Dr. Cesare Alippi, Learning in non-stationary environments



3. Dr. Paul Werbos, From ADP to the Mammal Brain and Beyond: Foundations, Roadmap, Challenges and New Options for Quantum Neural Nets



4. Dr. Alessandro Costabeber, Dr. Paul Werbos and Dr. Robert Kozma



5. Dr. Kim Boyer, Sensing Room Occupancy Distributions for Smart Lighting Applications



6. Dr. Rodrigo Palma, Solar Energy Challenges in Chile



7. First Place Poster Competition, Student Andrea Colins



8. Second Place Poster Competition, Students Ledys Salazar, Harvey Rosas, Rodrigo Salas, Víctor Morales



9. Second Place Poster Competition, Students Slavia Vojkovic and Isabel Weber



10 . Third Place Poster Competition, Students Gina Sierra, Antonio Bayas and Leonel Gutierrez



11 Dr. Claudio Held and Dr. Ludmilla Werbos



12. Dr. Paul Werbos, How Latin America Could Save the World by Changing the Game on Renewable Energy



13. Dr. Cesare Alippi, Intelligent Embedded Systems