IEEE – CIS

XIV Summer School on Computer Intelligence EVIC 2018

At Universidad de Santiago, Santiago, Chile

Artificial Intelligence or Computational Intelligence is driving a revolution in the most diverse areas, from medicine to mining through everything that affects our daily life, ranging from the use of social networks to the management of complex organizations. The Summer School on Computational Intelligence (EVIC) has been held annually since 2004, to disseminate the latest advances in Computational Intelligence techniques. The name of the Summer School is EVIC, which is an acronym for the name in Spanish. This year's version was held in 3 days, December 12th to 14th, 2018. The EVIC is jointly organized by the Chilean Chapter of the IEEE Computational Intelligence Society and the institution that hosts it, which in year 2018 was the Universidad de Santiago de Chile (USACH).

At EVIC our aim is to show state-of-the-art research and developments in Computational Intelligence (Neural Networks, Fuzzy Logic, and Evolutionary Computation, etc.), and also to spread the knowledge about Computer Intelligence by explaining the basics of its models, algorithms, and their applications in many different areas. EVIC is a reference event in Latin America, which brings together the entire ecosystem that revolves around Computational Intelligence and its academic, business and industrial-related opportunities. Computational Intelligence applications in different areas were discussed, such as: Intelligent Control Systems, Astroinformatics, Biomedical Engineering, Bio-informatics, Robotics, Computer Vision, Computational Neuroscience, Scientific Data and Big Data, among others. (see more at www.evic.cl). The presentation structure was to have plenary talks in the mornings and tutorials in the afternoon. There were coffee breaks offered in each session. One of the afternoons was also host of the student poster competition. We also had a round table with entrepreneurs applying Computer Intelligence, who shared their experience and vision.

The program detail was as follows:

Plenary Talks:

P01: “"SVM over time to determine the self-regulation of cerebral blood flow”, by Prof. Max Chacón, Ph.D., Full Professor and Head of the physiological modeling group at the Department of Computer Engineering, Universidad de Santiago, Chile.

P02: “Fuzzy and neural network prediction intervals: planning, forecasting and control of microgrids”, by Prof. Doris Sáez Hueichapan, Ph.D., Full Professor and Deputy Director of the Electrical Engineering Department at University of Chile, Santiago, Chile.

P03: “Automatic synthesis of fuzzy systems: evolutionary and evolving fuzzy systems”, by Prof. Marley Vellasco, Ph.D., Director of the Department of Electrical Engineering and Head of the Computational Intelligence and Robotics Laboratory at Pontifícia Universidade Católica do Rio de Janeiro, Brazil.

P04: “Transfer learning through semi-supervised deep generative models”, by Prof. Pavlos Protopapas, PhD., Scientific Program Director and Lecturer at the Institute for Applied Computational Science, John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts U.S.A.

P05: “Computational intelligence applications in healthcare - Part 1”, by Gary Fogel, Ph.D., Chief Executive Officer of Natural Selection, Inc., San Diego, California, U.S.A, and Distinguished Lecturer IEEE CIS.

P06: “Computational intelligence applications in healthcare - Part 2”, by Gary Fogel, Ph.D., Chief Executive Officer of Natural Selection, Inc., San Diego, California, U.S.A, and Distinguished Lecturer IEEE CIS.

P07: “Generative adversarial network for time series with not fixed time length and time intervals”, by Prof. Pavlos Protopapas, PhD., Scientific Program Director and Lecturer at the Institute for Applied Computational Science, John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts U.S.A.

Tutorials:

T01: "Multiprocessor technologies and GPU", by Prof. Fernando Rannou, Universidad de Santiago, Chile.

T02: "Access to astronomical data and analysis in Python notebooks", by Prof. Amelia Bayo, Universidad de Valparaíso, Chile.

T03: "Pattern recognition application in industrial processes: from Chile to the world ", by Raúl Lastra, Rodrigo Palma, and Carlos Molina, Woodtech, Chile.

T04: "Artificial intelligence in the Chilean private industry", by Pablo Zegers, Anastasia, Chile.

T05: "The Universe in a stream: the challenge of astronomical alert brokers", by Prof. Francisco Förster, Universidad de Chile.

T06: "What are the challenges of AI in the retail industry?", by Christian Ramírez, Marco Zaror, Andrés Campos, Luis Izaguirre and Nicolás Nilo, Falabella, Chile.

T07: "Application of generative models in bioinformatics", by Andrés Ramírez and Eduardo Abeliuk, Teselagen, U.S.A.

T08: "Application of artificial intelligence for diagnostic support in the prevention of blindness", by Fernando Bernuy, DART, Chile.

T09: "How did the millennials vote in the 2017 presidential elections? A look from the data and models ", by Cristóbal Huneeus, Unholster, Chile.

T10: "Bio-inspired systems in image processing and robotics applications", by Prof. María-José Escobar, Universidad Técnica Federico Santa María, Chile.

T11 "Deep learning in Astronomy: images and light curves", by Prof. Guillermo Cabrera, Universidad de Concepción, Chile.

T12: "Non-parametric cluster analysis of human optical brain imaging data", by Prof. Giovanni Motta, Pontificia Universidad Católica de Chile.

T13: "Learning latent representations for astronomical data using neural networks", by Prof. Pablo Huijse, Universidad Austral de Chile.

T14: "SVM and CNN for pattern recognition in volcanic seismic signals" by Prof. Millaray Curilem, Universidad de la Frontera, Chile.

T15: "Data orchestration with spark", by Prof. Juan Carlos Maureira, Universidad de Chile.

T16: "Machine learning for self-calibration in radio-astronomy", by Prof. Pablo Román,, Universidad de Santiago, Chile.

T17: "Bayesian nonparametric spectral estimation", by Prof. Felipe Tobar, Universidad de Chile.

T18: "Training of autonomous agents with interactive reinforcement learning", by Prof. Francisco Cruz, Universidad Central, Chile.

T19: "Biomedical applications in Chile", by Prof. Víctor Castañeda, Universidad de Chile.

Poster competition:

We had a very successful competition: 37 posters were registered; of those, 32 were selected. The posters that entered the competition came from 3 different universities from Santiago, 6 universities from other regions in Chile, one Chilean conservationist organization and 6 foreign universities. To allow each poster to be presented by a student, we organized different judges' teams, which made a two-round selection. The professors that joined the juries were Marley Vellasco, Pavlos Protopapas, Gary Fogel, Claudio Held, Marcela Jamett, Leonel Medina, Millaray Curilem, Pablo Roman, Francisco Cruz and Felipe Bello. The winning poster was "Automatic cortical mesh parcellation based on graph representation of short fiber connections", by Felipe Silva and Pamela Guevara, from Universidad de Concepción. They were awarded a US$ 200 prize and a plate certificate. The second and third place went to "Prediction Intervals With LSTM Networks Trained By Joint Supervision", by Nicolás Cruz, Luis Marín and Doris Sáez; and "Low-Pass Filtering as Bayesian Inference", by Cristobal Valenzuela and Felipe Tobar. Both were from Universidad de Chile, and each received a plate certificate.

Show and recruiting booths (new this year):

We had 3 sponsors from industry: Unholster, Woodtech and Falabella. Unholster is a software development company, founded in 2008. Its focus is the creation of solutions with high quality standards, developing projects in different areas such as Big Data, Optimization, Data Visualization, Artificial Intelligence, Process Automation, Custom Web / Mobile Apps and Public Intelligence. Woodtech is a technology development company for the timber industry. It invests between 10% and 15% of its profits in applied R & D projects. Its main objective is to improve processes to increase efficiency, control and optimization of resources, generating products that integrate different hardware technologies and intelligent software systems, using pattern recognition, machine learning, etc. Falabella is a large retail holding that has an internal division to develop systems based on computational intelligence techniques. Each of the sponsors installed a recruiting booth and gave a tutorial (see tutorials list: T09, T03 and T06). According to their feedback, it was a very good experience for all of them.

Round table:

There was the opportunity to discuss about Computational Intelligence in Industry, moderated by Pablo Zegers, entrepreneur in Artificial Intelligence, founder of Aparnix, Sortbox and Anastasia (www.anastasia.ai), in Chile. He was joined by Eduardo Abeliuk, co-founder of TeselaGen Biotech, San Francisco; USA, Raúl Lastra, Chief Technology Officer at Woodtech S.A., Chile, and Sebastián Acuña, founder and Chief Technology Officer at Unholster, Chile.

The Organizing committee of the XIV version of EVIC included:

1) General Chair: Prof. Gonzalo Acuña, Universidad de Santiago
2) General Co-Chair: Prof. Pablo Román, Universidad de Santiago
3) Honorary Chair: Prof. Pablo Estévez, IEEE CIS Past President, Universidad de Chile

4) IEEE CIS Chilean Chapter Chair: Prof. Claudio Held, Universidad de Chile
5) IEEE CIS Chilean Chapter Co-Chair: Pablo Zegers, Anastasia.
6) Tutorials Chair: Prof. Leonel Medina, Universidad de Santiago
7) Publicity Chair: Prof. Doris Saez, Universidad de Chile
8) Poster Competition Chair: Prof. Felipe Bello, Universidad de Santiago
9) Scholarships Chair: Prof. Millaray Curilem, Universidad de la Frontera
10) Industry Partnership: Jorge Maturana, Chair Computer Specialists Association, Universidad de Santiago.

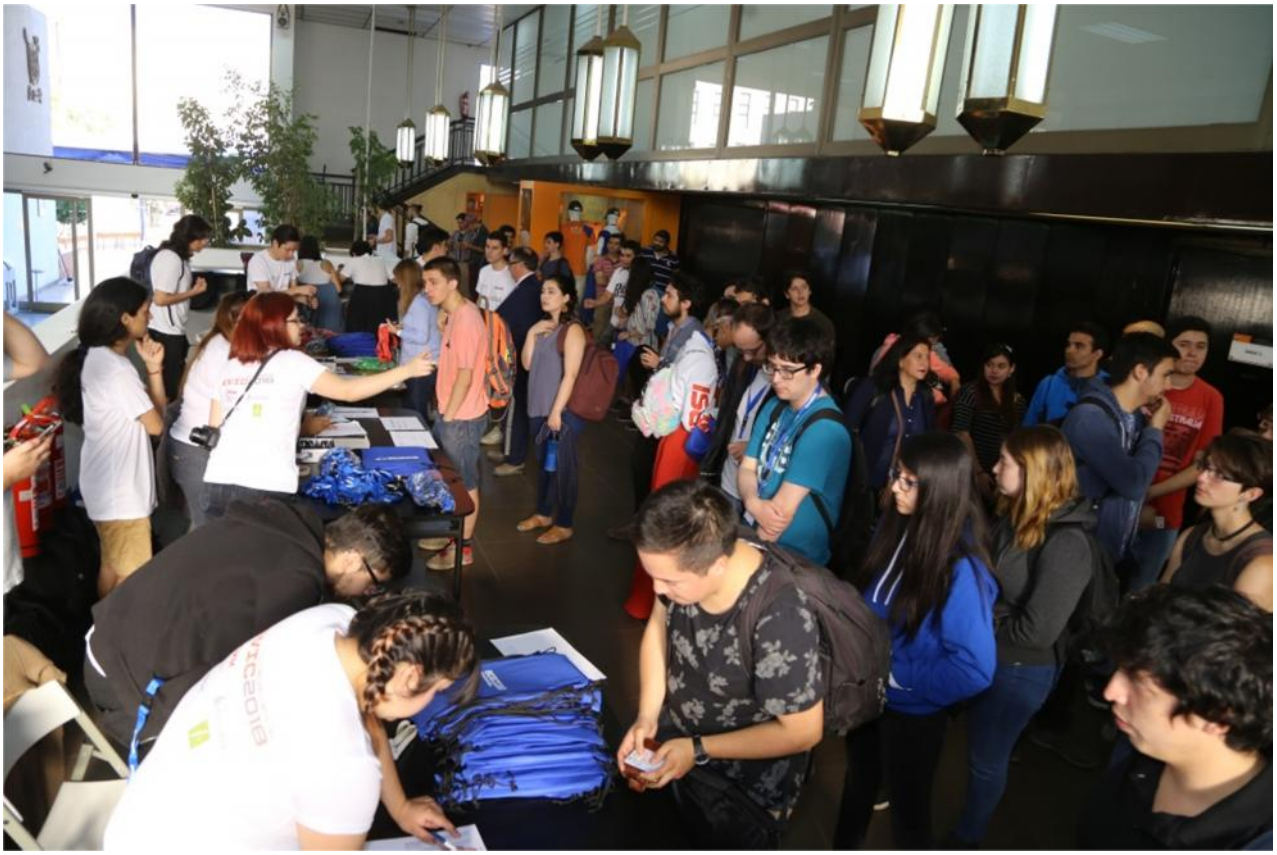
Without counting the speakers, helping personnel, organizers and people at the sponsor's booths, 243 people registered for EVIC 2018, an absolute record for EVIC. 132 came from Santiago, 105 visited from other regions in Chile, and 6 came from abroad. This time, EVIC was co-organized by the Computer Engineering Department of Universidad de Santiago. The School was highlighted by the university news, as can be seen at https://www.fing.usach.cl/2018/12/20/evic-instalo-la-tematica-de-inteligencia-artificial-en-nuestra-universidad-con-exitoso-evento/.

The Summer School is based on volunteers; its success was the result of a lot of work by the organizers and mentioned speakers, poster presenters and other people who helped with the logistics. Although the students had to pay a small amount for registration, EVIC would not have been possible without the financial support of IEEE-CIS, the Center for Mathematical Modelling, Universidad de Chile, the Vice-rectory for Research, Development and Innovation of Universidad de Santiago, and three companies from different industries, engaged in Computer Intelligence applications: Unholster, Woodtech and Falabella.

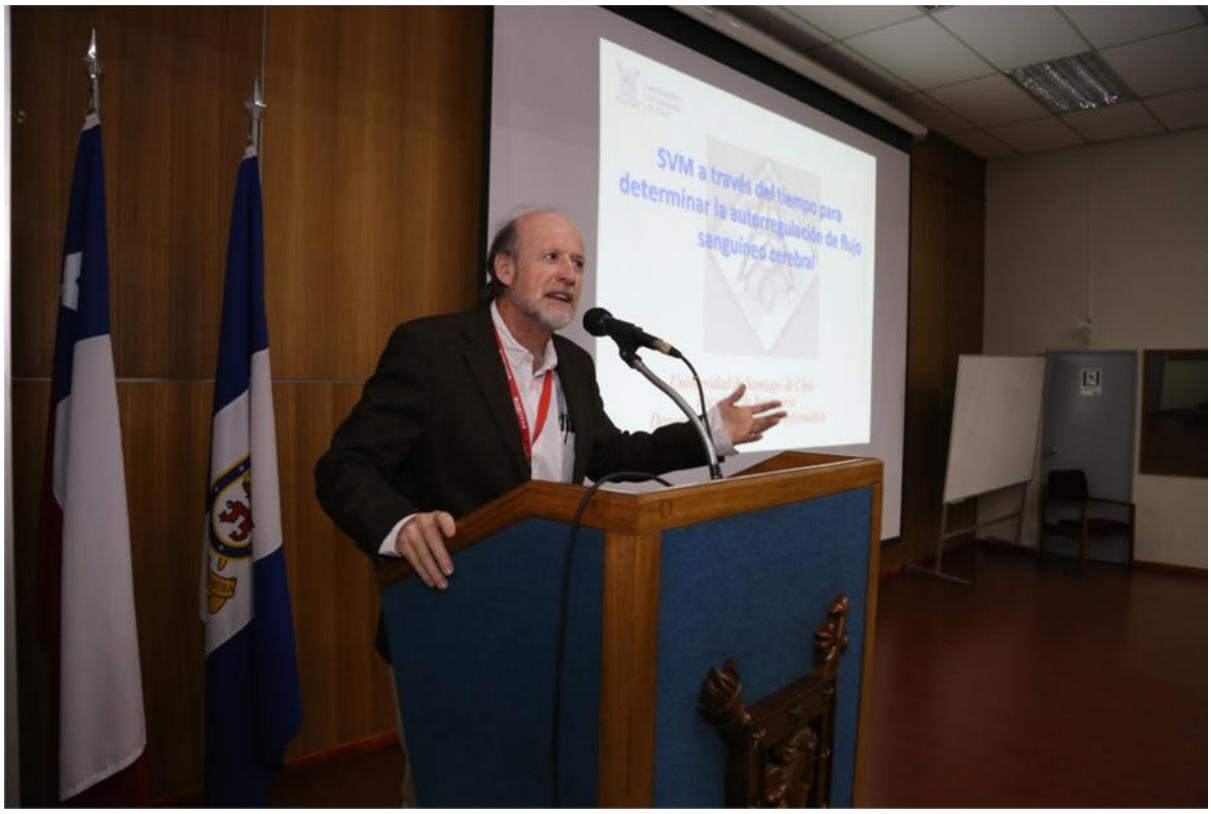
As in previous years, EVIC offered travel and registration grants. Priority was given to students participating in the poster competition, students from universities outside Santiago and graduate students. Moreover, there were special grants for female students, to promote wider participation of women in mathematics, science and engineering. In general, more than 110 students received some form of support.

Profs. Doris Sáez and Millaray Curilem applied to a CIS Membership Development Initiative project, for gender promotion at EVIC 2018. Besides the focused grants to

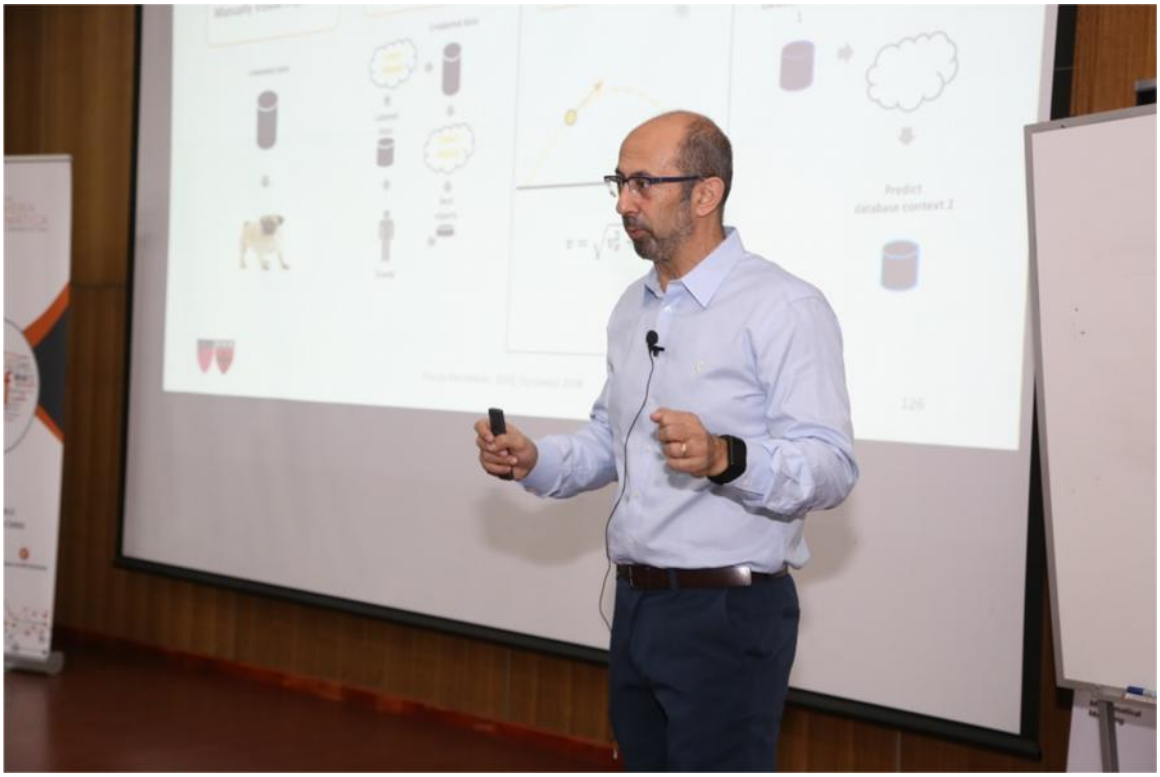
increase women registration, there was a lunch meeting with women students and professors, and women experts presented two plenary talks and four tutorials. Enhancing female participation was successful, as a sizable amount of women took part in EVIC 2018. (see article in https://www.fing.usach.cl/2019/01/03/evic-tuvo-record-de-participacion-femenina/?fbclid=IwAR1cndoUXlMludHti8MjJKVA6AUGg3VTY6d6LFmuPO7G). 45 women students received registration grants and 37 received travel grants. 62 woman students participated in the luncheon, as well as professors Marley Vellasco (Pontificia Universidad Católica de Rio de Janeiro), Gary Fogel (Natural Selection, Inc), Claudio Held (chair of the Chilean Chapter of the IEEE CIS) and Rosa Muñoz (Vice-Dean of the Faculty of Engineering, Universidad de Santiago), among others.



Student attendees of EVIC 2018 stand in line to pick up their credentials and hand-out material

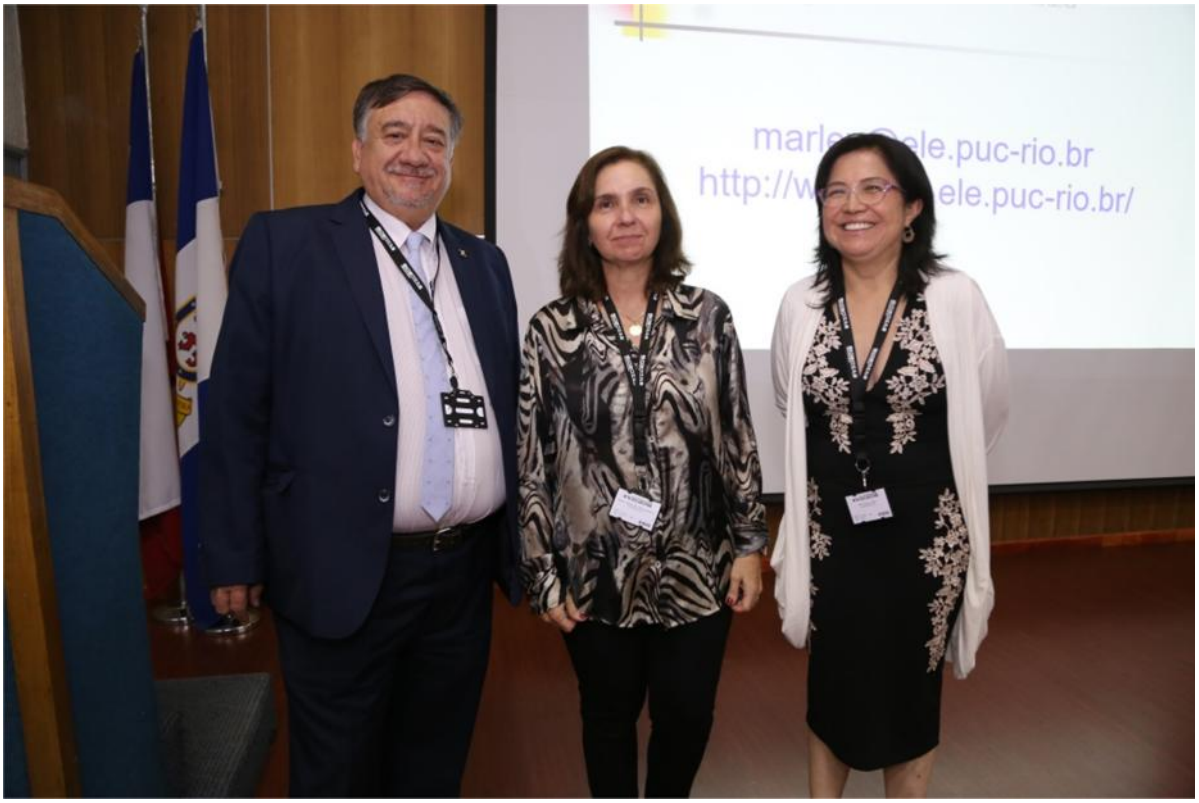


Dr. Gonzalo Acuña (Universidad de Santiago) General Chair of EVIC 2018, opens the Summer School

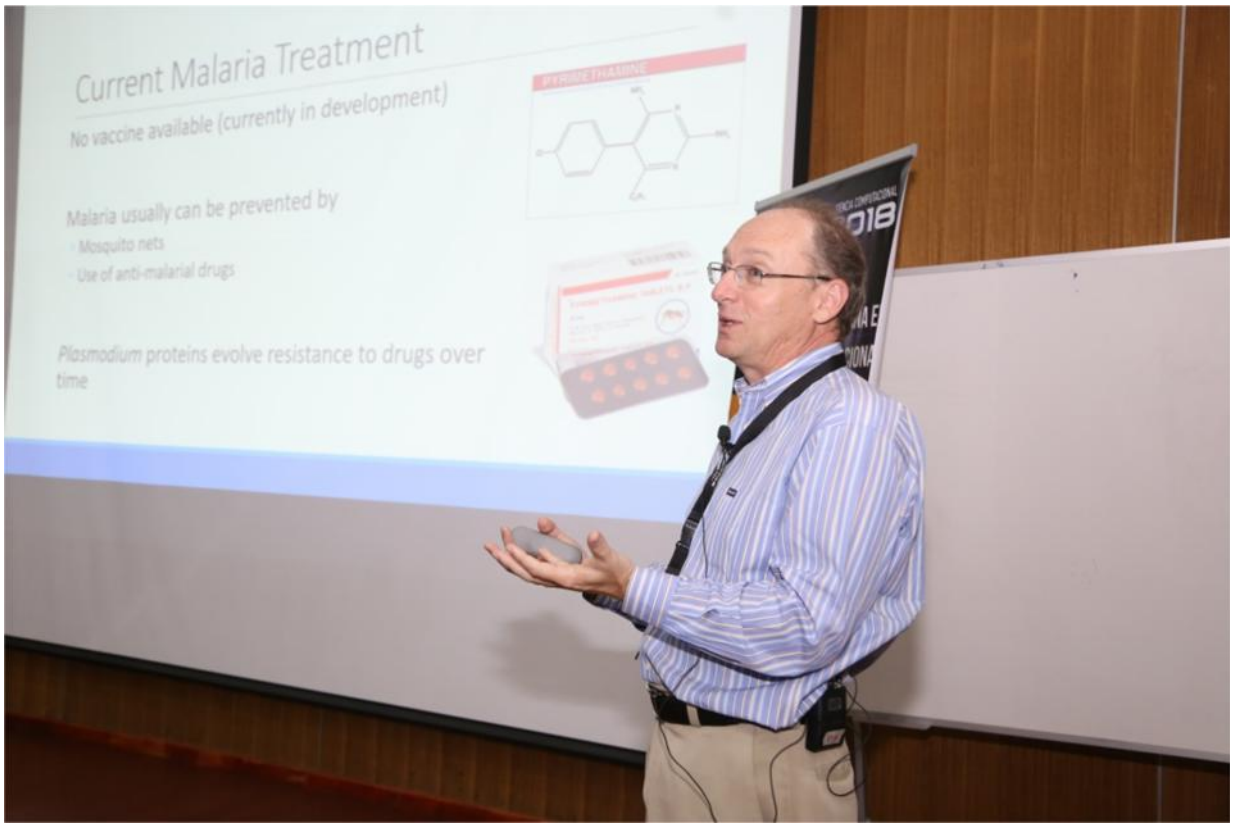


Dr. Pavlos Protopapas (Harvard University) delivering his talk on transfer learning through semi-supervised deep generative models.

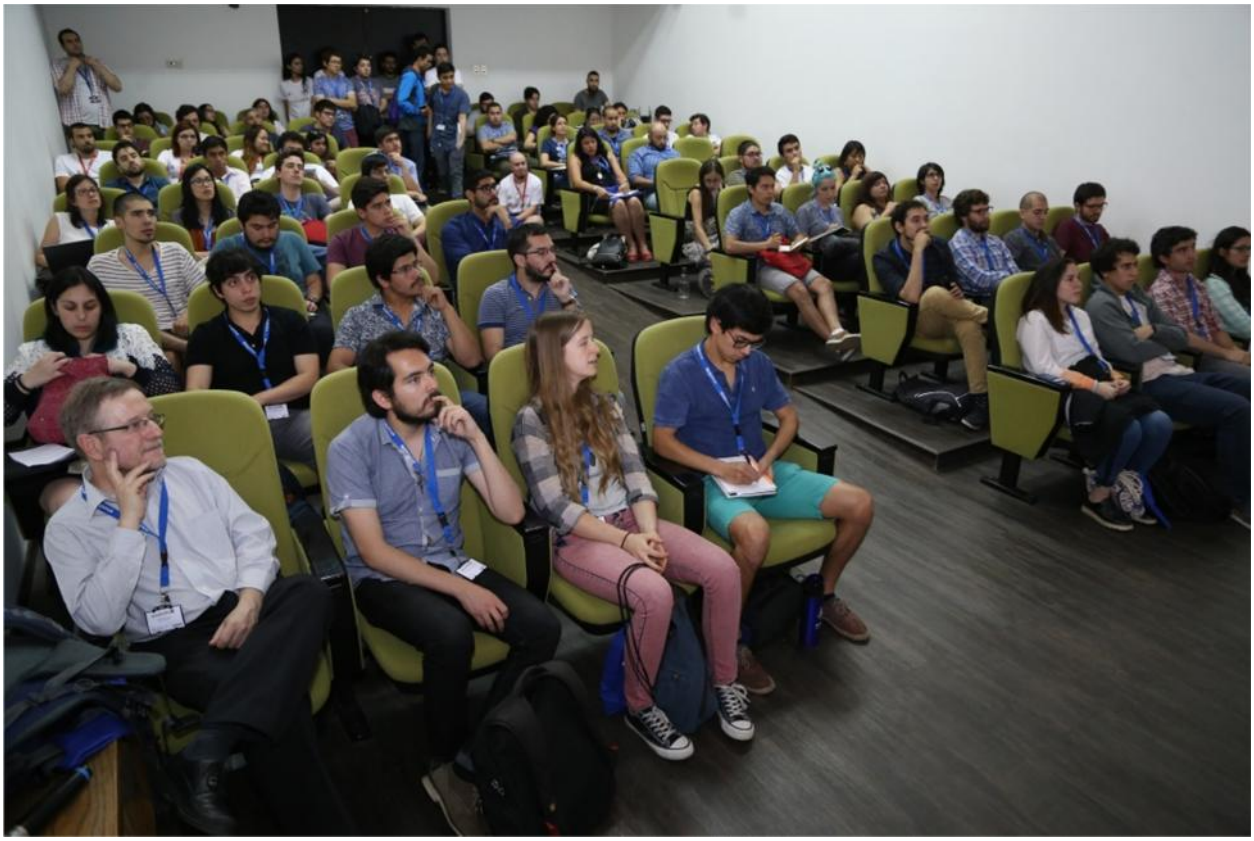
Questions time at the end of a plenary session at EVIC 2018, in the Enrique Frömel auditorium, Universidad de Santiago.



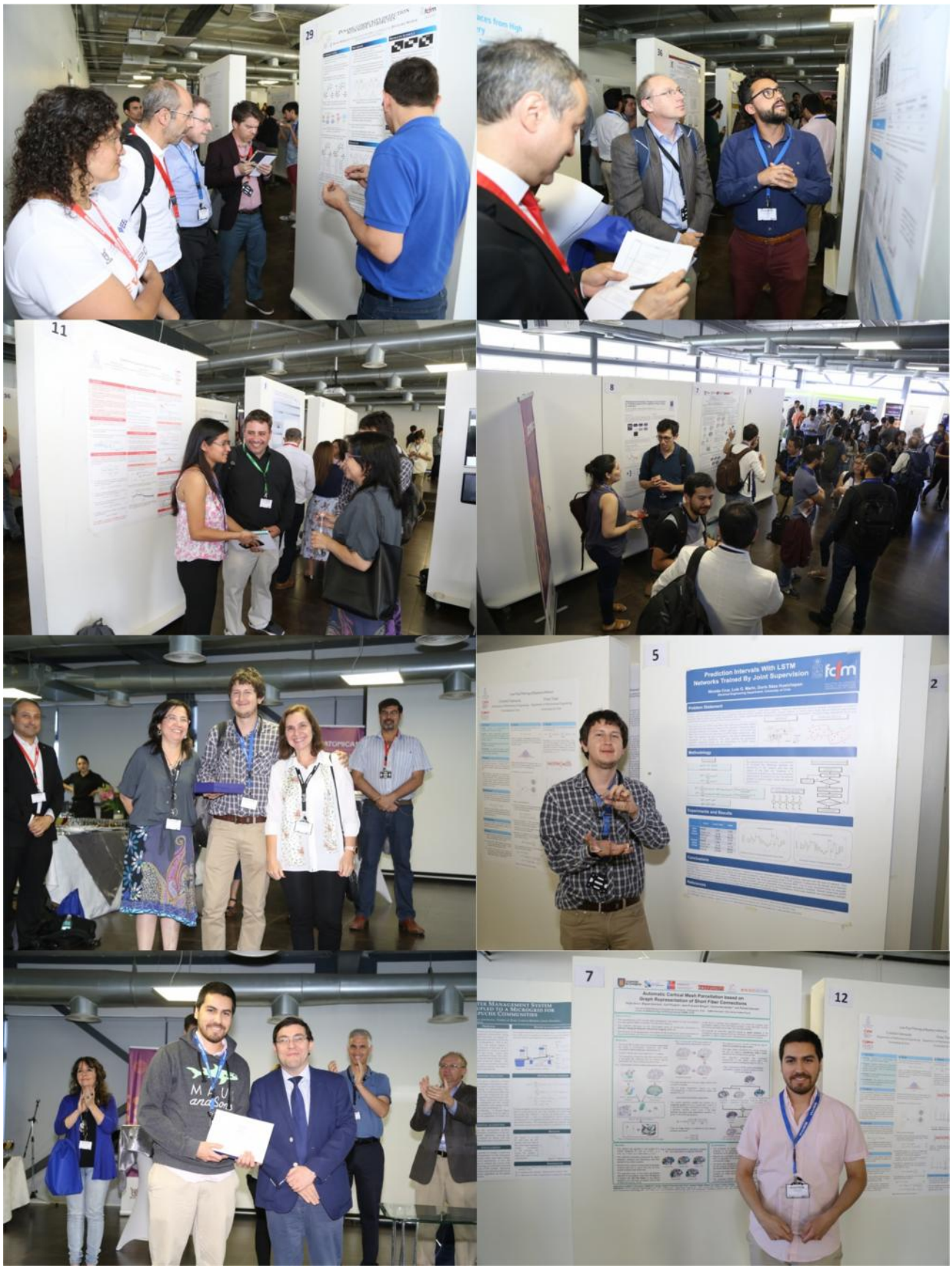
Drs. Max Chacón (Universidad de Santiago), Marley Vellasco (P. Catholic University, Río de Janeiro, Brazil) and Doris Sáez (Universidad de Chile), all plenary speakers at EVIC 2018.



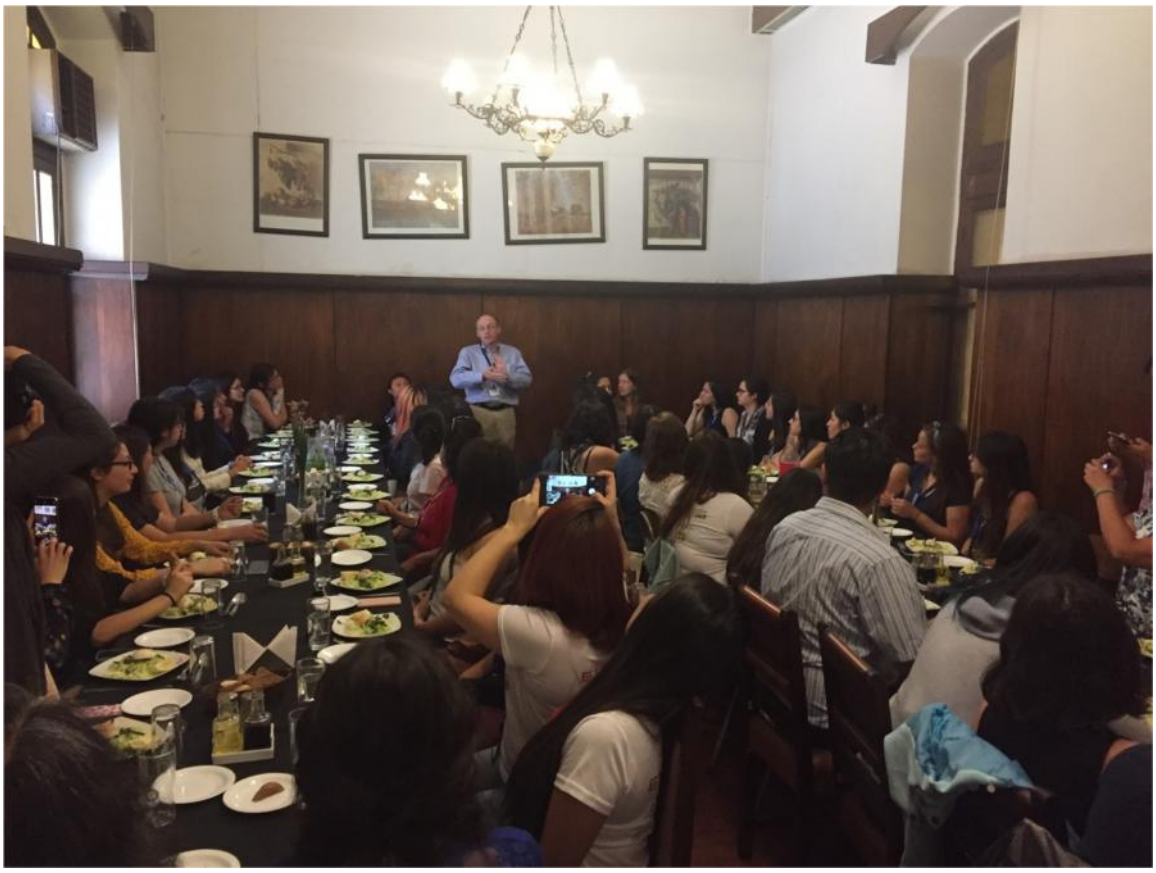
Dr. Gary Fogel (Natural Selection, Inc), DL IEEE CIS, delivering his talk on computational intelligence applications in healthcare.



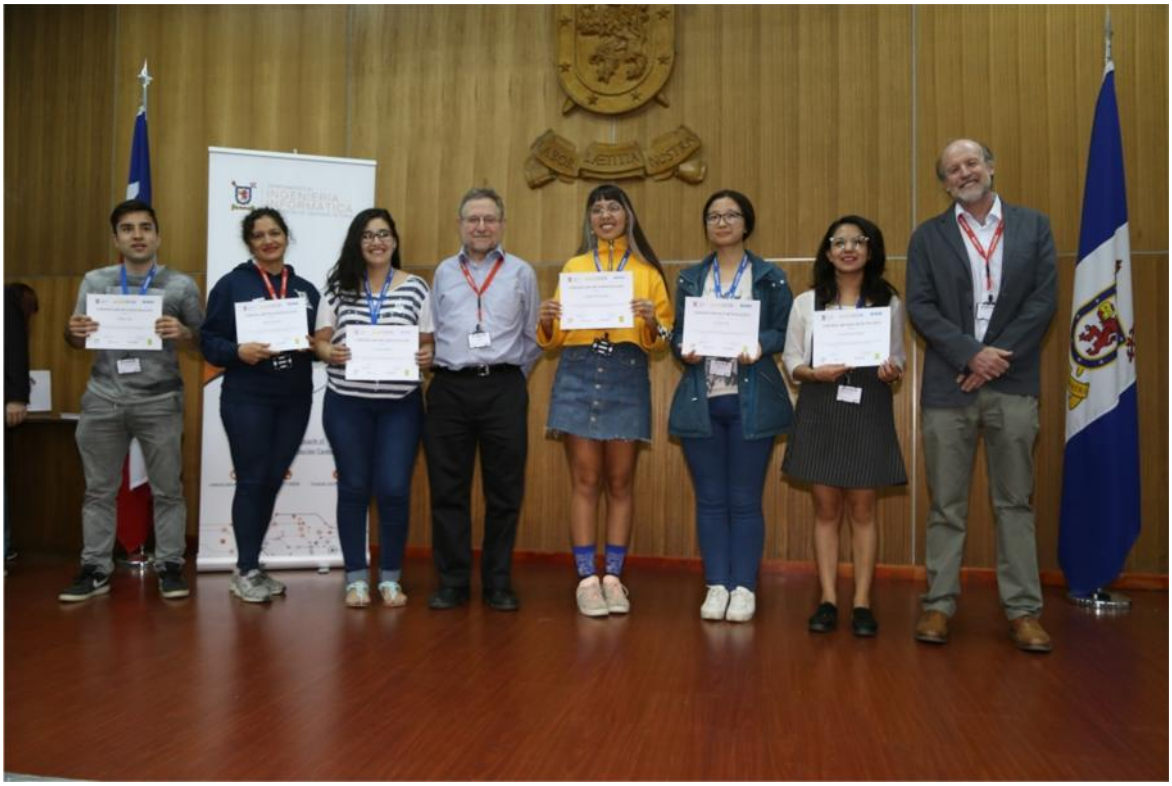
Well attended tutorial at EVIC 2018 in one of the the VIME building rooms, Universidad de Santiago.



Student poster competition: Juries in action and winners, at EVIC 2018, Universidad de Santiago, Chile.



Dr. Gary Fogel, DL IEEE CIS, invited to the women's lunch, which was well attended with over 60 people.



Participation certificated were handed out to each attendee at the end ceremony of EVIC 2018 at Universidad de Santiago.