IEEE – CIS

XV Summer School on Computer Intelligence EVIC 2019

At Universidad Austral de Chile, Valdivia, 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. Our 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 16th to 18th, 2019. The EVIC is jointly organized by the Chilean Chapter of the IEEE Computational Intelligence Society and the institution that hosts it, which in year 2019 was the Universidad Austral de Chile (UACh), in Valdivia.

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, Robotics, Natural language processing, Computer vision, Bioinformatics, and Big Data, among others. (see more at www.evic.cl). The presentation structure was to have plenary talks in the mornings and two parallel tracks of tutorials in the afternoon. There were coffee breaks offered in the morning and in the afternoon. One of the afternoons was also host to the student poster competition. The program detail was as follows:

9:00 - 10:30 Plenary talk

Millaray Curilem, Universidad de la Frontera, Chile

"CI Challenges for Seismic Pattern Recognition Applied to Volcanoes"

11:00 - 12:30 Plenary talk

Igor Škrjanc, University of Ljubljana, Slovenia

"Evolving Fuzzy Systems"

14:00 - 15:30 Tutorial

Fernando Huenupan, Universidad de la Frontera, Chile

"Reconocimiento de patrones y sus aplicaciones en ingeniería"

14:00 - 15:30 Tutorial

Matthieu Vernier, Universidad Austral de Chile, Chile

"Tutorial de Dynamic Topic Models en el contexto del estallido social en Chile"

16:00 - 17:30 Tutorial

Bárbara Poblete, Universidad de Chile, Chile

"Introducción al análisis y aprendizaje desde redes sociales: desinformación, troles, privacidad y otras hierbas"

16:00 - 17:30 Tutorial

Juan Tapia, Universidad Tecnológica de Chile, Chile

"Selfie-Biometric, Sex-classification from Cell-Phones Periocular Images"

17:30 - 19:00 Tutorial

Denis Parra, Pontificia Universidad Católica de Chile, Chile

"Equidad, Explicabilidad y Transparencia en Algoritmos de inteligencia artificial"

17:30 - 19:00 Tutorial

Pablo Huijse, Universidad Austral de Chile, Chile

"Deep Neural Networks in PyTorch and Probabilistic Programming with Pyro"

9:00 - 10:30 Plenary talk

Jim C. Bezdek, University of Melbourne, Australia, IEEE-CIS DL

"Every picture tells a story: Visual Cluster Assessment in Square and Rectangular Relational Data"

11:00 - 12:30 Plenary talk

Sanaz Mostaghim, University of Magdeburg, Germany

"Recent Advances in Multi-Objective Evolutionary Algorithms"

14:00 - 15:30 Plenary talk

Jim M. Keller, University of Missouri, United States of America

"Streaming Consciousness on Streaming Clustering"

16:00 - 17:30 Tutorial

Susana Eyheramendy, Universidad Adolfo Ibáñez, Chile

"How to identify causal relations through Mendelian randomization"

16:00 - 17:30 Tutorial

Robert Cercos, Spike, Chile

"Recommender Engine: desde la idea hasta la puesta en producción"

16:00 - 19:00 Poster competition

17:30 - 19:00 Tutorial

Felipe Tobar, Universidad de Chile, Chile

"Wasserstein-Fourier: A novel distance for time series"

17:30 - 19:00 Tutorial

Pablo Zegers, Aparnix/Sortbox, Chile

"Aplicaciones de IA en Chile"

19:00 - 20:00 Poster competition ceremony

Wednesday December 18th, 2019

9:00 - 10:30 Plenary talk

Sanaz Mostaghim, University of Magdeburg, Germany

"Multi-Criteria Decision Making Algorithms: Individual and collective decision-making in autonomous systems"

11:00 - 12:30 Plenary talk

Jim M. Keller, University of Missouri, United States of America

"Recognition Technology: A modern perspective of Lofti Zadeh's vision"

14:00 - 15:30 Plenary talk

Jim C. Bezdek, University of Melbourne, Australia, IEEE-CIS DL

"How big is too big? Clustering in (static) BIG DATA with the Fantastic 4"

16:00 - 17:30 Tutorial

Doris Sáez, Universidad de Chile, Chile

"Fuzzy/Neural Modeling and Control of a Mapuche Indigenous Community Microgrid"

16:00 - 17:30 Tutorial

Jorge Vergara, Universidad Tecnológica Metropolitana, Chile

"Feature Selection and Its Use in Big Data"

17:30 - 18:30 Closing ceremony

<u>Poster competition:</u>

We had a successful student poster competition: 25 posters were registered; of those, 21 were selected. The posters that entered the competition came from 10 different universities: 3 from Santiago, 6 from other regions in Chile and one foreign university. Each student presented their work in 5 minutes to a team of three judges, followed by Q&A. We organized two teams of judges, which made a two-round selection. The first team of judges was formed by Professors Jim C. Bezdek, Sanaz Mostaghim and Gonzalo Acuña. The second team was formed by Professors Jim M. Keller, Igor Skrjanc and Millaray Curilem. The second and final round was decided by all the judges.

The winning poster was "Gaussian process imputation of multiple financial series", by Alejandro Cuevas, Universidad de Chile, who was awarded a certificate plus USD 200. The second and third place went to "MPCC: Matching Priors and Conditionals for Clustering", by Nicolas Astorga, Universidad de Chile, and "Machine learning-based algorithms for the identification of the boosted di-Higgs event on the ATLAS experiment" by Andrea Rodriguez, Universidad Federico Santa María, who received certificates plus a sample of Valdivian delicacies. Two honorable mentions were awarded to "Prediction of running related injury incidence from training sessions descriptors of amateur trail runners" by Gabriela González, Universidad Austral de Chile, and "Fuzzy Interval Modelling based on Joint Supervision" by Sebastián Parra, Universidad de Chile.

<u>Sponsors:</u>

We had 3 sponsors from industry who helped in the summer school funding: Optimisa S.A., Telsur GTD and TOC. Optimisa S.A. is a major systems integrator, headquartered in Chile, specializing in mission critical systems. Telsur is a telecommunications company based in the south of Chile that is currently expanding to data analysis and automation. TOC is a company specialized in the development of identity verification technologies and applications derived from biometric technology.

The Organizing committee of the XV version of EVIC included:

1) General Chair: Prof. Pablo Huijse, Universidad Austral de Chile
2) General Co-Chair: Prof. Eliana Scheihing, Universidad Austral de Chile
3) Program chair: Prof. Daniel Luhr, Universidad Austral de Chile
4) Tutorials Chair: Prof. Rafael Rodriguez, Universidad Austral de Chile
5) Poster Competition Chair: Prof. Matthieu Vernier, Universidad Austral de Chile
6) Industry partnership: Prof. Victor Poblete and Pablo Chandia, Universidad Austral de Chile
7) Publicity Chair: Prof. Doris Saez, Universidad de Chile
8) Scholarships Chair: Prof. Millaray Curilem, Universidad de la Frontera
9) Honorary Chair: Prof. Pablo Estévez, IEEE CIS Past President, Universidad de Chile
10) IEEE CIS Chilean Chapter Chair: Prof. Claudio Held, Universidad de Chile
11) IEEE CIS Chilean Chapter Co-Chair: Pablo Zegers, Anastasia.
12) Previous EVIC General Chair: Prof. Gonzalo Acuña, Universidad de Santiago, Chile

This year we had a total of 211 attendees, apart of the speakers (18), helping personnel (5) (mostly students) and organizers (8). This corresponds to 62 students from the Universidad Austral de Chile, Valdivia, 117 students from another 15 different Chilean universities located in Santiago and other regions, 4 international students (Colombia and Mexico) and 28 Chilean professionals. The School was highlighted by the regional newspaper "El Diario Austral" https://www.australvaldivia.cl/impresa/2019/12/17/papel/ (front page and page 5) and in the university news[1] . The presentation structure was to have plenary talks in the mornings and parallel sessions of tutorials in the afternoon. There were coffee breaks offered in the morning and in the afternoon. EVIC includes an extensive grant program to help students to attend.

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[1]

https://diario.uach.cl/fci-reune-a-destacados-investigadores-nacionales-e-internacionales-en-inteligencia-computacional/

DL talks were open for free for all IEEE members. An invitation to members was posted in the local section webpage: https://ieeechile.cl/invitacion-a-2-charlas-del-prof-jim-c-bezdek/.

The Summer School is based on volunteers; its success was the result of a lot of work by the organizers and mentioned speakers. 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 InnovING 2030 project from the Universidad Austral de Chile, and our three sponsors from industry: Optimisa S.A., Telsur GTD and TOC.

As in previous years, EVIC offered travel and registration grants. Priority was given to students participating in the poster competition, students from universities outside Valdivia and graduate students. This year we had special grants for female and indigenous students, to promote their participation in mathematics, science and engineering. In general, more than 50 students received some form of support.

Profs. Doris Sáez and Millaray Curilem applied to a CIS Membership Development Initiative project, for gender and ethnic promotion at EVIC 2019. Besides the focused grants to increase women and indigenous students registration, there was a lunch meeting with students and professors to create networks and invite them to IEEE activities. The initiative also considered the participation of women and/or indigenous experts who presented three plenary talks and two tutoriales.
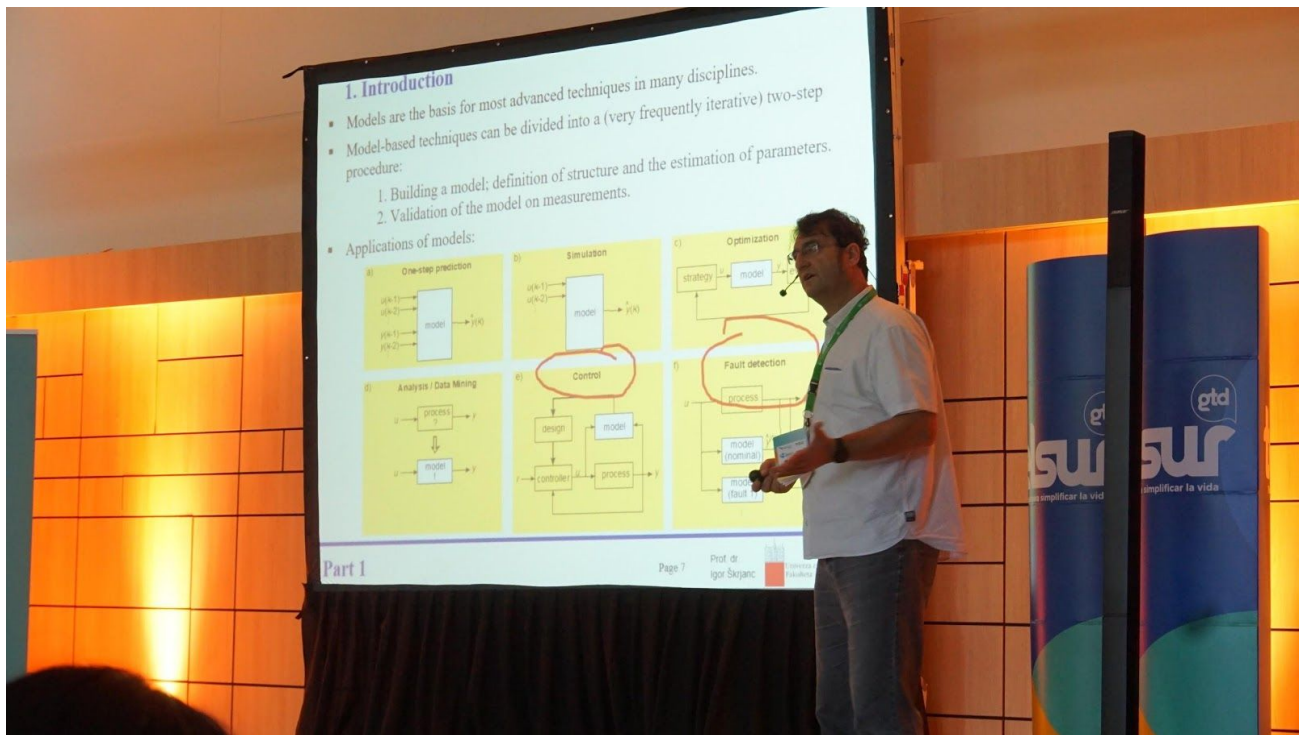
In total of 37 women students received registration grants and 28 received travel grants. 9 indigenous students received registration grants and 7 received travel grants. 55 students participated in the luncheon, as well as professors Sanaz Mostaghim (Magdeburg University, Germany), Millaray Curilem (Universidad de la Frontera, Chile), Igor Skrjanc (University of Ljubljana, Slovenia), Doris Sáez (Universidad de Chile) and Claudio Held (chair of the Chilean Chapter of the IEEE CIS), among others.
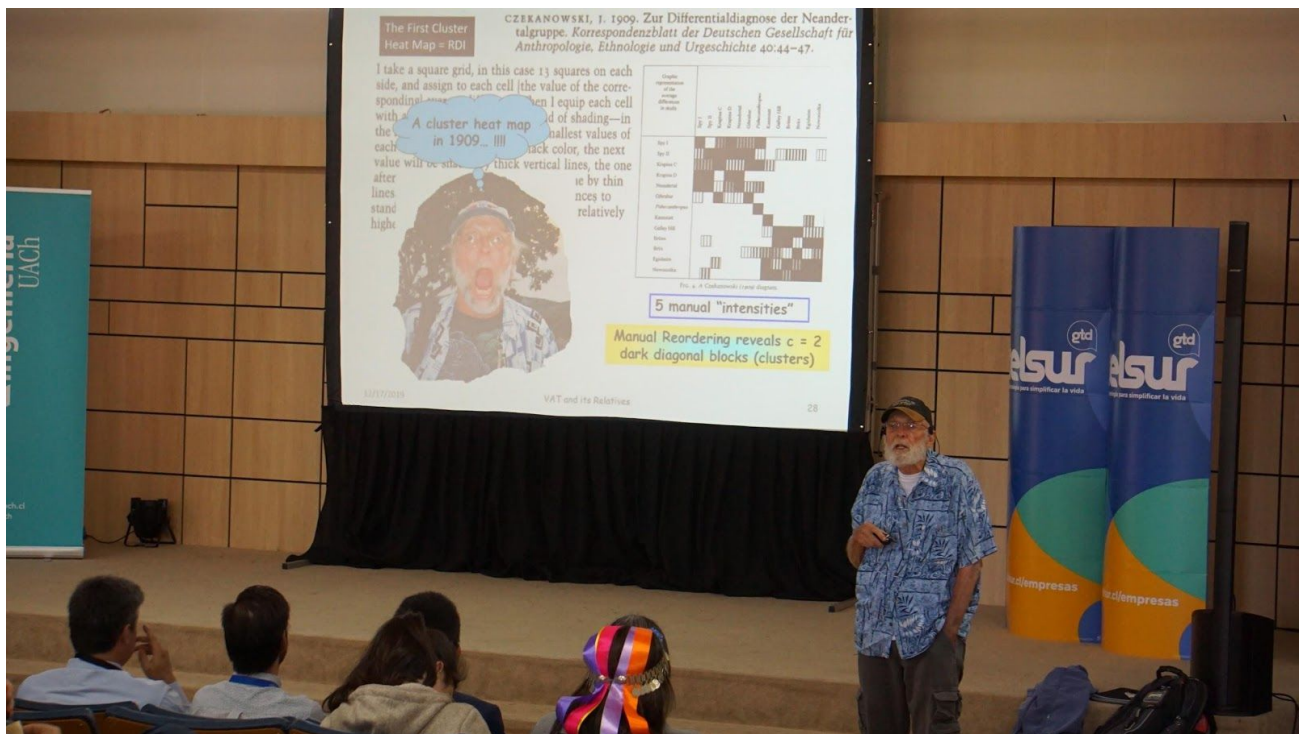
The main auditorium of the engineering campus, Universidad Austral de Chile, with more than 200 attendees for the first plenary talk of EVIC 2019

Prof. Millaray Curilem, Universidad de la Frontera, giving her plenary talk
"CI Challenges for Seismic Pattern Recognition Applied to Volcanoes"

Dr. Igor Skrjanc (University of Ljubljana, Slovenia) giving his plenary talk on Evolving Neuro-fuzzy systems

Dr. Jim C. Bezdek, DL IEEE CIS, delivering his talk on *"Every picture tells a story: Visual Cluster Assessment in Square and Rectangular Relational Data"*

Dr. Sanaz Mostaghim giving her plenary talk *"Multi-Criteria Decision Making Algorithms: Individual and collective decision-making in autonomous systems"*

Dr. James M. Keller giving his plenary talk *"Recognition Technology: A modern perspective of Lofti Zadeh's vision"*

We had 12 tutoriales in afternoon sessions. The picture above shows Jorge Vergara with his tutorial *"Feature Selection and Its Use in Big Data".* The picture below shows Doris Sáez giving her tutorial *"Fuzzy/Neural Modeling and Control of a Mapuche Indigenous Community Microgrid"*

Lunch meeting with more than 55 students and professors in the context of the IEEE CIS Membership Development Initiative project, for gender and ethnic promotion at EVIC 2019.

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Moments from the student poster competition at EVIC 2019

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Participation certificates were handed out to each attendee at the closing ceremony of EVIC 2019

Group picture at the closing ceremony of EVIC 2019 serious one (above), funny one (below)