

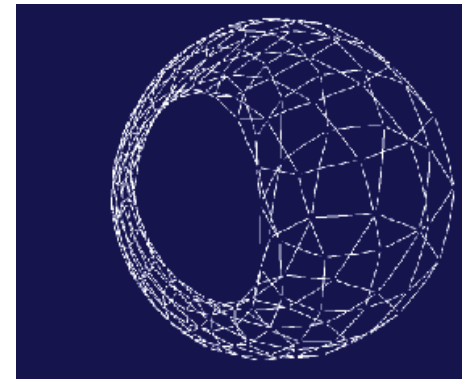
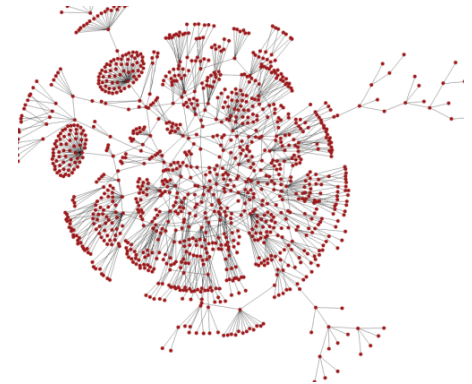


**Area of Impact: Process Optimization**  
**Specialty: Mathematical Modeling; Large Networks;**  
**Computer Sciences; Theoretical Computer Science**

The lack of information or coordination between agents interacting in large networks is common in countless daily situations. A typical example can be found when people in Santiago have to move towards their respective workplaces. Each driver decides the best route considering a diversity of variables: some are constant (for example, the distance to the destination point or the speed limits on different streets), others depend on the behavior of the various agents involved (congestion due to heavy traffic) and additional factors that can be external to the system (crashes, power outages at traffic lights, etc.). The problem is that the information each agent has at hand during the decision-making process is local, incomplete and stochastic, so it is impossible to determine with certainty the best route to your destination.

In situations like this, optimal solutions cannot be found, at least not in an efficient way; for this reason, much of their investigation consists in the development of algorithms that find approximate solutions (close to optimal), that are robust (useful for different scenarios of uncertainty), dynamic (updated as the system evolves) or online (renewed according to the amount of information available). Consequently, the main objective of ICR is to consolidate a focal point of world-class research within the fields of Algorithms, Combinatorial, Game Theory and Optimization, considering its connections to network problems that are characterized by lack of information and lack of coordination. Our group has three lines of investigation relevant to the issues described:

- The algorithmic game theory that studies efficient algorithms to determine the behavior of a group of agents that optimize separate objectives.
- The study of big data problems, from online algorithms that work with partial information to the compressed representation of data.
- Research on the structure of large networks, their dynamics and their protocols.



- Organization of world-class conferences such as IPCO.
- Large number of visiting professors from top universities of the world (20 per year).
- Cooperation agreements with international centers (GDR-MOA in France and Max Planck Institute for Informatics in Germany).
- Plenary lectures by researchers of the Nucleus Center in major international conferences (ISMP, OR, LATIN, etc.).
- Participation in the editorial board of the most prestigious journals within our field of research.

DIRECTOR: **José Correa**  
ACTING DIRECTOR: **Iván Rapaport**



José Correa



Iván Rapaport

Contact email: **acgo@dii.uchile.cl**  
Communications email: **correa@uchile.cl | nicolasf@uc.cl**  
Telephone: **+56 2 2978 4046**  
Web: **acgo.uchile.cl**

NÚCLEO MILENIO  
INFORMACIÓN Y  
COORDINACIÓN EN REDES

## RESEARCHERS

**Principal Researcher:**  
José Correa

**Acting Principal Researcher:**  
Iván Rapaport

**Assistant Researchers:**  
Fernando Ordóñez  
Juan Peypouquet  
José Zamora

**Associate Researchers:**  
Daniel Espinoza  
Jeremy Barbay  
Nicolás Figueroa  
Gonzalo Navarro  
Pablo Pérez-Lantero  
José Soto  
Maya Stein  
José Verschae

**Junior Researchers:**  
Gustavo Angulo  
Mario Bravo  
Hiep Han  
Andrea Jiménez

**Senior Researchers:**  
Roberto Cominetti  
Marcos Kiwi  
Martín Matamala  
Jorge Vera

**Postdoctorate Researcher:**  
Rubén Hoeksma

## RESEARCH TOPICS

- Algorithmic Game Theory.
- Networks: Structure, Dynamics, and Protocols.
- Massive Data Sets.

## NOTED OUTREACH ACTIVITIES

- Training Courses for CMAT teachers.
- Days of educational and promotional activities involving CMAT medalists, didactic activities, lectures and courses for students with championship medals.
- Impact in Chile through the design of a new school admission mechanism (in collaboration with the Ministry of Education).
- Organization of a seminar about social networks in the industry (over 200 participants from different companies).
- Design and implementation of new allocation software used by the DEMRE.

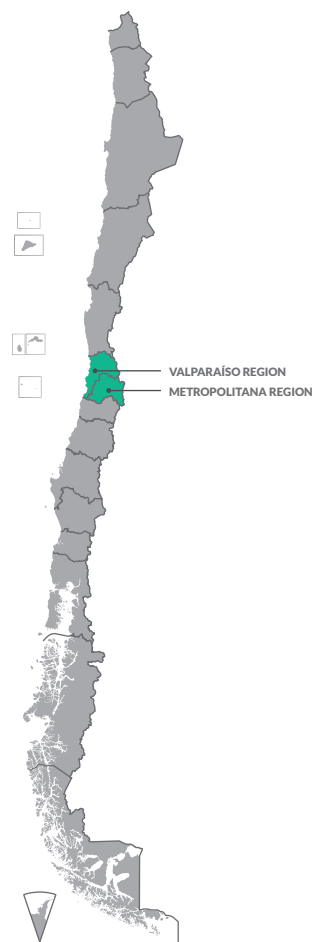
 **PRODUCTIVITY PUBLICATIONS  
(BETWEEN 2013-2014)**

ISI: 108 |  
BOOKS OR BOOK CHAPTERS: 2 |  
OTHER PUBLICATIONS: 3

 **ACTIVE MILLENNIUM NUCLEUS CENTER  
From 12/24/2014 to 12/24/2017**

The Millennium Nucleus Centers can be renewed  
after 3 years, reaching a maximum of 6 years.

 **PRESENCE  
METROPOLITANA REGION  
VALPARAÍSO REGION**



## HOST INSTITUTIONS:

