

Paul Leger, Ph. D. in Computer Science

Associate Professor & Software Engineer
Civil Engineering School
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Pragmatics lab: <http://pragmatics-lab.com> (Director)
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Personal

Name: Paul Leger
Hometown: Coquimbo, Chile
Nationality: Chilean



Education

Visiting Researcher, universities across the world:

- Centre for Development of Advanced Computing (C-DAC), India, 2024 (3 weeks).
- University of The Andes, Colombia, 2021 (3 weeks).
- Tokyo Institute of Technology, Japan, 2019 (6 months).
- University of Cauca, Colombia, 2018 (2 months).
- Shibaura Institute of Technology (x 2), Japan, 2013-2014 (4-2 months).
- École des mines de Nantes, France, 2010 (2 months).

Certifications:

- "Fundamentals of English Medium Instruction", University of Pennsylvania, 2023 (August).
- "Teaching University", Highest level, Catholic University of the North, 2024 (January).

Ph. D. in Computer Science, University of Chile, 2006 - 2012.

- Subject: Opening Up Trace-Based Mechanisms.
- Advisor: Éric Tanter (<http://pleiad.cl/etanter>).

Engineering degree in Computer Science, University of La Serena, 1999 - 2005 (July).

B.Sc. in Computing Science, University of La Serena, 1999 - 2005 (April).

Research Keywords

Programming languages. Modularity, abstractions, different approaches, and from the functional programming to novel programming approaches.

Software engineering. Developing tools to help programmers in software construction.

Agent-based models. The application of agent-based models to predict social behaviors in different environments (e.g., social network sites like Twitter).

Scientific Services

Manager (x 7)

- **Subdirector in Engineering Systems Doctorate**, Coquimbo (Chile), <https://dsi-en.ucn.cl>, 2023 - present.

- **Research Secretary at the Engineering School**, Coquimbo (Chile), <http://eic.ucn.cl>, 2023 - present.
- **Pragmatics Lab. Founder and director of the research laboratory in software development and simulations of agent-based models**, Virtual (Chile), <http://pragmatics-lab.com>, 2018 - present.
- **Ph. D. coordinator of Engineering Systems Doctorate**, Coquimbo (Chile), <https://dsi-en.ucn.cl>, 2023.
- **Head of two undergraduate program studies at the Engineering School**, Coquimbo (Chile), <http://eic.ucn.cl>, 2021 - 2022.
- **Director on Chilean Computer Science Society (SCCC)**, Santiago (Chile), <https://sccc.cl>, 2020 - 2022.
- **Member of two Master Program at the UCN**, Coquimbo (Chile), <http://www.ucn.cl>, 2016 - 2018.

Funded Projects (x 3)

- **Pluralismo (ANID) 2023 (ANID-Chilean Government) "Evaluación de Estrategias para Diseminar Noticias Falsas Usando Inteligencia Artificial (Assessment of Strategies to Disseminate Fake News Using Artificial Intelligence)" (PLU230018)**, Santiago (Chile), <https://anid.cl/concursos/xv-concurso-de-estudios-sobre-pluralismo-2023>, 2023 - 2024, **NOTE: Principal Researcher.**
- **Fondef-VIU (ANID – Chile) "Análisis y Valorización de datos de comportamiento del usuario captados durante visitas a pilotos inmobiliarios y utilizando realidad virtual"**, Santiago (Chile), <https://www.anid.cl/investigacion-aplicada/valorizacion-de-la-investigacion-en-la-universidad-viu>, 2019, **NOTE: Principal Researcher.**
- **KAKENHI-Project (Japanese government) "Software engineering and wireless sensor networks" (26330089)**, Tokyo (Japan), <https://kaken.nii.ac.jp/search/?kw=26330089>, 2014 - 2018, **NOTE: Co-Researcher.**

Organizer (x 4)

- **Jornadas chilenas de la computación**, Coquimbo (Chile), <https://jcc2020.cl>, 2020, **SCOPUS.**
- **Workshop on Context-Oriented Programming and Advanced Modularity (COP) - European Conference on Object-Oriented Programming (ECOOP)**, Virtual Event (Germany), <https://2020.eoop.org/home/COP-2020>, 2020, **SCOPUS.**
- **Track on Modularization for Practical Software Engineering (MPSE) - International Conference on Bio-inspired Information and Communications Technologies**, New York (USA), <http://bionetics.org>, 2015, **SCOPUS.**
- **Track on Modularization for Practical Software Engineering (MPSE) - International Conference on Bio-inspired Information and Communications Technologies**, New York (USA), <http://bionetics.org>, 2014.

Journal Editor (x 4)

- **Editorial Member on Frontiers in Computer Science**, ISSN: 2624-9898, Frontiers, 2023 - present, **JCR-ISI.**
- **Editorial Member on Journal of Innovations in Digital Marketing**, ISSN: 2765-8341, Luminous Insights, 2021 - present.
- **Guest Editor on Information and Software Technology - Special Issue on Visualization applied to Software Engineering**, ISSN: 0950-5849, Elsevier, 2021, **JCR-ISI.**
- **Guest Editor on International Journal of Software Engineering and Knowledge Engineering**, ISSN: 1793-6403, World Scientific, 2015, **JCR-ISI.**

Journal Reviewer (x 38)

- **IEEE Transactions on Reliability**, ISSN: 0018-9529, IEEE, 2024, **JCR-ISI.**

- **International Journal of Information Systems and Supply Chain Management**, ISSN: 1935-5726, IGI Global Publishing, 2023, SCOPUS.
- **Tsinghua Science and Technology** (x 2), ISSN: 1007-0214, SciOpen, 2023, JCR-ISI.
- **IEEE Access** (x 2), ISSN: 2169-3536, IEEE, 2022 - 2023, JCR-ISI.
- **Proceedings of the Institution of Mechanical Engineers - Part C: Journal of Mechanical Engineering Science** (x 3), ISSN: 0954-4062, Sage, 2022 - 2023, JCR-ISI.
- **Applied Science** (x 3), ISSN: 2076-3417, MDPI, 2022 - 2023, JCR-ISI.
- **Security and Communication Networks**, ISSN: 1939-0122, Hindawi, 2022, JCR-ISI.
- **Informatics for Health and Social Care**, ISSN: 0098-3063, IEEE, 2022, JCR-ISI.
- **Complexity** (x 2), ISSN: 1076-2787, Hindawi, 2022, JCR-ISI.
- **Transactions on Consumer Electronics**, ISSN: 0098-3063, IEEE, 2022, JCR-ISI.
- **Education Research International**, ISSN: 2090-4002, Hindawi, 2022, SCOPUS.
- **International Journal of Computer Games Technology**, ISSN: 1687-7047, Hindawi, 2022, SCOPUS.
- **Journal of Simulation** (x 2), ISSN: 1747-7778, Tandfonline, 2019 - 2022, JCR-ISI.
- **IEEE Latin America Transactions** (x 8), ISSN: 1548-0992, IEEE, 2018 - 2022, JCR-ISI.
- **Ingeniería y Competitividad**, ISSN: 0123-3033, University of the Valley, 2021, SCIELO-COLOMBIA.
- **Journal of Computer Languages** (x 2), ISSN: 2590-1184, Elsevier, 2020, JCR-ISI.
- **Soft Computing**, ISSN: 1432-7643, Springer, 2019, JCR-ISI.
- **Ingeniare** (x 2), ISSN: 0718-3305, Universidad de Tarapacá, 2018, SCOPUS.
- **Formación Universitaria**, ISSN: 0718-5006, CIT, 2018, SCOPUS.
- **Spanish Journal of Marketing**, ISSN: 2444-9709, Emerald, 2017, SCOPUS.
- **Journal of Technology Management & Innovation**, ISSN: 0718-2724, Universidad Alberto Hurtado, 2015, SCOPUS.

Chair (x 9)

- **Industry Track on IEEE International Conference on Software Maintenance and Evolution (ICSME)**, Bogota (Colombia), <https://cyprusconferences.org/icsme2022>, 2023, SCOPUS, NOTE: Core-Rank A.
- **Lo Mejor de lo Nuestro (LMN) ("the best of ourselves")**, Santiago (Chile, <https://jcc2022.ing.puc.cl/lmn2022>, 2022, SCOPUS.
- **International Conference of the Chilean Computer Science Society (SCCC)**, Coquimbo (Chile), <https://jcc2021.cl>, 2021, SCOPUS, NOTE: The most important computer science conference in Chile.
- **Context-Oriented Programming and Advanced Modularity (COP)**, Virtual Event (Germany), <https://2020.ecoop.org>, 2020, SCOPUS.
- **Session Chair on Track on Software Engineering (SE)-ACM Symposium on Applied Computing (SAC)**, Marrakech (Morocco), <http://selab.uos.ac.kr/sacse17>, 2017, SCOPUS.
- **Track on Modularization for Practical Software Engineering (MPSE) - International Conference on Bio-inspired Information and Communications Technologies** (x 3), Boston (USA), <http://bionetics.org>, 2014 - 2016, SCOPUS..
- **Publicity Chair on 9th International Conference on Bio-inspired Information and Communications Technologies**, New York (United States), <http://bionetics.org>, 2015, SCOPUS.

Program Committee Member (x 16)

- **International Conference on Software Technologies (ICSOFT)**, Dijon (France), <https://icsoft.scitevents.org/ProgramCommittee.aspx>, 2024, SCOPUS.

- **Brazilian Symposium on Programming Languages (SBLP)**, Mato Grosso do Sul (Brazil), <https://cbsoft2023.ufms.br/en-US/sblp>, 2023, SCOPUS.
- **Brazilian Symposium on Programming Languages (SBLP)**, Virtual Event (Brazil), <https://cbsoft2022.facom.ufu.br/sblp.php>, 2022, SCOPUS.
- **Context-Oriented Programming and Advanced Modularity (COP)**, Berlin(Germany), <https://2022.ecoop.org/home/COP-2022>, 2022, SCOPUS.
- **Brazilian Symposium on Programming Languages (SBLP)**, Natal (Brazil), <http://cbsoft2020.imd.ufrn.br/sblp.php>, 2020, SCOPUS.
- **Congreso Internacional de Computación e Informática del Norte de Chile (INFONOR)** (x 6), Norte de Chile (Chile), <https://infonorchile.cl>, 2013 - 2019.
- **ACM Symposium on Applied Computing (SAC) - Track on Software Engineering (SE)**, Pau (France), <https://www.sigapp.org/sac/sac2018>, 2018, SCOPUS.
- **ACM Symposium on Applied Computing (SAC) - Track on Software Engineering (SE)**, Marrakech (Morocco), <https://www.sigapp.org/sac/sac2017>, 2017, SCOPUS.
- **ACM Symposium on Applied Computing (SAC) - Track on Software Engineering (SE)**, Pisa (Italy), <https://www.sigapp.org/sac/sac2016>, 2016, SCOPUS.
- **ACM Symposium on Applied Computing (SAC) - Track on Software Engineering (SE)**, Salamanca (Spain), <https://www.sigapp.org/sac/sac2015>, 2015, SCOPUS.
- **New Ideas or Emerging Results (NIER) and Tool Demo (TD) - Third IEEE Working Conference on Software Visualization (VISOFT)**, Santiago (Chile), <http://vissoft.dcc.uchile.cl>, 2015.

Evaluator (x 10)

- **External Reviewer of Master Thesis: "Keen: Kotlin Genetic Algorithms Framework"**, University of Chile (Chile), <http://www.uchile.cl>, 2024.
- **Evaluator of Fondef-IDeA Projects**, ANID (Chile), <https://anid.cl/concursos/concurso-idea-id-tecnologias-avanzadas-2024>, 2023.
- **Evaluator of Exploration Projects**, ANID (Chile), <https://www.anid.cl/proyectos-de-investigacion/proyectos-de-exploracion>, 2022.
- **External Reviewer of Master Thesis: "Points-to Analysis for Context-Oriented JavaScript Programs"**, University of the Andes (Colombia), <https://uniandes.edu.co/en>, 2022.
- **External Reviewer of Master Thesis: "Ad Hoc Systems Management and Specification with Distributed Petri Nets"**, University of the Andes (Colombia), <https://uniandes.edu.co/en>, 2021.
- **External Reviewer of Master Thesis: "Analysis of WebRTC signaling"**, University of the Andes (Colombia), <https://uniandes.edu.co/en>, 2021.
- **Research Project**, Pontificia Universidad Católica de Valparaíso (Chile), <http://www.pucv.cl>, 2018.
- **External Reviewer of Master Thesis: "Verificación progresiva de programas en Dafny"**, Pontificia Universidad Católica de Valparaíso (Chile), <http://pucv.cl>, 2018.
- **External Reviewer of Master Thesis: "Discovering Memory Optimization Opportunities by Analyzing Shareable Objects"**, University of Chile (Chile), <http://www.uchile.cl>, 2017, OTHER.
- **Evaluator on Short Internship Projects (MEC)**, ANID (Chile), <http://www.conicyt.cl/pai>, 2014.

Academic Experience

Lecturer

Postgraduate (x 7)

Applied Research Practice, Doctorate of Engineering System, Catholic University of the North, 2024.

Thesis Proposal, Magister Program, Catholic University of the North, 2019 - 2021.

Advanced Topics in Management of Information Technology II, Magister Program, Catholic University of the North, 2020.

Advanced Topics in Management of Information Technology I, Magister Program, Catholic University of the North, 2019.

Research Methodology, Magister Program, Catholic University of the North, 2018.

Design Patterns, Computer and Telecommunication Engineering, Diego Portales University, 2011.

Objects and Aspects, Computer and Telecommunication Engineering, Diego Portales University, 2010.

Undergraduate (x 43)

Algorithms and Programming, Engineering, Catholic University of the North, 2024.

Programming Languages (x 5), Computer Civil Engineering, Catholic University of the North, 2021 - 2024.

Agent-Based Model for Social Simulation (Guided Research), Computer Science Engineering, Catholic University of the North, 2021.

Data Structure (x 5), Computer Civil Engineering, Catholic University of the North, 2018 - 2021.

Complex Engineering Problems, Information and Information Technology, Catholic University of the North, 2020.

Applied Science Project, Computer Civil Engineering, Catholic University of the North, 2020.

Data Science Application to the use of Programming Languages (Guided Research), Computer Science Engineering, Catholic University of the North, 2020.

Introduction to Research in Computer Science, Computer Science Engineering, Catholic University of the North, 2019.

Management Information System Development, Information and Management Control, Catholic University of the North, 2018.

Communication Elements (x 5), Information and Management Control, Catholic University of the North, 2014 - 2018.

DataBase (x 4), Information and Management Control, Catholic University of the North, 2013 - 2017.

Process Modelling (x 3), Information and Management Control, Catholic University of the North, 2013 - 2016.

Programming (x 3), Information and Management Control, Catholic University of the North, 2013 - 2016.

Programming and Database, Business Management, Catholic University of the North, 2012.

Programming Languages and Paradigms, Computer Civil Engineer, University of Talca, 2012.

Programming (x 5), Industrial Civil Engineering, Diego Portales University, 2010 - 2012.

Advanced Programming, Industrial Civil Engineering, Diego Portales University, 2010.

Computing 1 (x 3), Computer and Telecommunication Engineering, Diego Portales University, 2009.

Thesis Advising (x 26)

Postgraduate (x 2), Catholic University of the North, 2017 - 2021.

Undergrad (x 24), Catholic University of the North, 2013 - 2021.

Evaluations as Professor

Catholic University of the North (Three consecutive times) Best professor evaluation for undergrad teaching in School of Business Studies, 2012 - 2014.

Diego Portales University (Spanish) "Paul dictó varios cursos (incluso cursos de postgrado) en nuestra carrera, él mostró cercanía con los alumnos y capacidad suficiente para motivarlos a interiorizarse en la materia", Jonathan Frez (jonathan.frez@udp.cl), Teaching Management, of School of Computer Science and Telecommunications Engineer telecommunications.

University of Talca (Spanish) "Vistos los resultados de la encuesta, el prof. Leger obtiene puntaje por sobre el promedio del Departamento y de la Facultad en cada uno de los ítems de la encuesta...". Ruth Garrido (rgarrido@utalca.cl), Head of School of Computer Science Engineer.

Software Development Engineer

As I enjoy working on software engineering, I occasionally work as a freelancer doing software development and as a team manager in software projects:

Macrosoftware. Consulting software engineer, 2020 - present.

G-Tech. Project Manager, a startup mobile application, 2022.

Autopista Central. Consulting engineer, 2017.

Regional Observatory (working market). Software project manager, implementation of an information system that allows users to analyze working market in a region of Chile, 2016 - 2017.

Autopista Central. Consulting engineer, 2011.

Center for Advanced Research in Arid Zones (CEAZA). Research assistant, two tasks: a) using MM5 (mesoscale model) to simulate or predict mesoscale atmospheric circulation and b) applying artificial neural networks to group/classify rainfall scenarios (both tasks applied to a limited-area in Chile), 2002 - 2004.

Viña Ocho Tierras. Project Manager of Web Site, 2002.

Software Development for Research

My software projects are more related to creating complex software artifacts than developing traditional industrial software (*e.g.*, Inventory Management). Source: <http://pleger.cl/software>.

EMAjs: JavaScript library that implements an Expressive and Modular Activation mechanism for context-oriented programming. <https://github.com/pragmaticslaboratory/EMAjs>, 2022.

CommerceSimulator: Java software to simulate buyers in e-commerce like Amazon, AliExpress, and Wish. This simulation considers the endorsements theory. Finally, this software can be used to execute different kinds of experiments. <https://github.com/pleger/ABME-market>, 2021.

DeloreanJS: A back-in-time debugger for JavaScript. This software is strongly developed by Felipe Ruiz (felipe.ruiz@alumnos.ucn.cl) and Guillermo Victorero (guillermo.victorero@alumnos.ucn.cl). You can try it on <http://pleger.cl/sites/deloreanjs>. <https://github.com/pragmaticslaboratory/deloreanjs>, 2019.

AspectScript: An aspect-oriented extension of JavaScript for expressive AOP, which integrates several state-of-the-art features related to higher-order programming and expressive scoping of aspects. <https://pleiad.cl/aspectscript>, 2010.

Matcher Cell: A JavaScript library to flexibly match patterns. You can try it on <https://pragmaticslaboratory.github.io/matcher-cells-study-cases>. <https://github.com/pragmaticslaboratory/match-cell-base>, 2021.

RAI-JS: A JavaScript library for Context-Oriented Programming (COP), which supports reactive activation mechanisms. You can try it on <http://pleger.cl/sites/raijs>. <https://github.com/pleger/rai-js>, 2019.

Sync/CC (proof of concept): A library to address callback issues on JavaScript. You can try it on <https://pleger.cl/synccc>. <https://github.com/pragmaticslaboratory/synnccc>, 2019.

ESA-JS: An implementation of ESA, describing an expressive stateful aspect language. A stateful aspect language supports the definition of monitors to observe and react to a program execution trace. They have numerous applications in domains like error detection, security, and modular definition of crosscutting concerns. 2012.

WeCa: A practical library that allows for modular and flexible control over causality issues on the Web. In contrast to current proposals, WeCa uses stateful aspects, message-ordering strategies, and vector clocks. WeCa has been used with several practical examples from Web applications. For instance, we analyze the flow of information in these applications like Twitter using WeCa. 2012.

Awards & Distinctions

The Best of Ourselves, two scientific articles have been selected on “The Best of Ourselves” on Chilean Computer Science Society (Chile), 2019 & 2022.

Funding for Visiting Researcher, Alliance of Pacific (AGCI 2018) for a research stay, Colombia, 2018. <https://alianzapacifico.net/becas-2>.

Best working paper award, AEMARK, Spain, 2015. <http://www.aemarkcongresos.com/congreso2015/es/premios>.

Selected as the best professor for undergrad teaching, Business School, Catholic University of the North, Chile, 2014 & 2017.

In the press,

El Observatorio, a Japanese-Chilean collaboration:

<http://www.elobservatodo.cl/noticia/tecnologia/expertos-de-japon-y-ucn-colaboran-en-proyectos-dedicados-computacion>

Viva Chile Elqui, only Chilean researcher who worked on the update of IT curricula:

<http://vivechileelqui.cl/2016/09/05/academico-ucn-es-unico-chileno-colaborando-en-actualizacion-mundial-en-computacion>

Ph. D. funding, Conicyt, Chile, 2007.

Ph. D. funding, Nic, Chile, 2006.

References

Hidehiko Masuhara. Ph. D. in Computer Science. Full Professor & Dean. Department of Mathematical and Computing Science. Tokyo Institute of Technology, Japan (masuhara@acm.org). Webpage: <https://prg.is.titech.ac.jp/people/masuhara>.

Éric Tanter. Ph. D. in Computer Science. Full Professor. Computer Science Department (DCC), University of Chile, Chile (etanter@dcc.uchile.cl). Webpage: <https://pleiad.cl/people/etanter>.

Alexandre Bergel. Ph. D. in Computer Science. Computer Scientist. Rational AI (<https://relational.ai>), Switzerland (alexandre.bergel@me.com). Webpage: <https://bergel.eu>.

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This resume is available on <http://pleger.cl/resume>