

# Cristobal Rodrigo Donoso Oliva

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## EDUCATION

### Latin American Council of Social Sciences

*Advanced Diploma in Artificial Intelligence and Social Sciences.*

**Remote**

*Sept 2024 - Current*

### University of Concepcion

*Master of Computer Science*

**Concepción, CHILE**

*April 2017 - Sept. 2019*

### University of Concepcion

*Computer Engineer*

**Concepción, CHILE**

*Mar. 2013 - Aug. 2018*

## EXPERIENCE

### Millennium Nucleus on Young Exoplanets and their Moons

*Research associates*

**Santiago, Chile**

*Dec. 2022 - current*

- Developing deep learning tools to find exo-moons from noisy astronomical images.
- Application of physically-informed neural networks to discover moon candidates.

### Harvard University and University of Concepcion

*Research associates*

**Concepcion, Chile**

*Jan. 2021 - current*

- Representation learning using Transformer architecture ([5]).
- Logistic and tutorials in MACI internship.

### Chilean ministry of Science, Technology, knowledge and Innovation

*Data Engineer*

**Chile**

*Feb. 2021 - May. 2021*

- Exploratory and descriptive analysis of citizen surveys after demonstrations of 2019.
- Implementation of natural language processing models for answers classification.

### Unidad de Data Science, University of Concepcion

*Project Engineer*

**Concepcion, CHILE**

*Nov. 2020 - Jan. 2021*

- Automatic detection of trees using georeferenced images.

### Unidad de Data Science, University of Concepcion

*Teaching Assistant*

**Concepcion, CHILE**

*Oct. 2020 - Dec. 2020*

- Data Science Diploma, Advanced Machine Learning

### University of Concepcion and Harvard University

*Research associates*

**Concepcion, Chile**

*Dec. 2019 - Dec. 2020*

- Astronomical time series forecast.

### Institute for Applied Computational Science, Harvard University

*Teaching Assistant*

**Boston, USA**

*Sept. 2019 - Dec. 2019*

- cs109a: Introduction to Data Science.
- cs207: Systems Development for Computational Science

### Institute for Applied Computational Science, Harvard University

*Research associates*

**Boston, USA**

*Sept. 2019 - Dec. 2019*

- Recurrent neural networks for the processing of astronomical data streams.

### Automatic Learning for the Rapid Classification of Events (ALeRCE)

*Researcher in ALeRCE*

**Santiago, CHILE**

*Aug. 2019 - Apr. 2019*

- Recurrent neural networks for the processing of astronomical data streams.

### Unidad de Data Science, University of Concepcion

**Concepción, CHILE**

<i>Project Engineer</i>	<i>Mar. 2019 - July 2019</i>
<ul style="list-style-type: none"> <li>Ground use case segmentation using satellite images and convolutional neural networks</li> <li>Automatic counting of trees using drone images and convolutional neuronal networks</li> </ul>	
<b>Department of Computer Science, University of Concepcion</b>	<b>Concepción, CHILE</b>
<i>Teaching Assistant</i>	<i>Mar. 2019 - current</i>
<ul style="list-style-type: none"> <li>Data Science II</li> </ul>	
<b>Automatic Learning for the Rapid Classification of Events (ALeRCE)</b>	<b>Concepción, CHILE</b>
<i>Research Collaborator</i>	<i>Oct. 2017 - current</i>
<ul style="list-style-type: none"> <li>Build machine learning algorithms to classify astronomical events.</li> </ul>	
<b>Department of Computer Science, University of Concepcion</b>	<b>Concepción, CHILE</b>
<i>Teaching Assistant</i>	<i>Aug. 2018 - Dec. 2018</i>
<ul style="list-style-type: none"> <li>Data Science I</li> </ul>	
<b>Institute for Applied Computational Science, Harvard University</b>	<b>Boston, USA</b>
<i>Research Student</i>	<i>Aug. 2018</i>
<ul style="list-style-type: none"> <li>Chile-Harvard Data Science School</li> </ul>	
<b>Department of Computer Science, University of Concepcion</b>	<b>Concepción, CHILE</b>
<i>Teaching Assistant</i>	<i>Mar. 2015 - June 2018</i>
<ul style="list-style-type: none"> <li>Propositional and First Order Logic</li> </ul>	
<b>Fastfit - CORFO project</b>	<b>Concepción, CHILE</b>
<i>Software Engineer Internship</i>	<i>Sept. 2017 - January 2018</i>
<ul style="list-style-type: none"> <li>Development of Integral Computer System for Fast Fit Gym</li> </ul>	
<b>Department of Computer Science, University of Concepcion</b>	<b>Concepción, CHILE</b>
<i>Teaching Assistant</i>	<i>Mar. 2015 - Aug. 2015</i>
<ul style="list-style-type: none"> <li>Teacher Assistant in Programming Language C</li> </ul>	
<b>San Ignacio High School</b>	<b>Concepción, CHILE</b>
<i>Teacher</i>	<i>Apr. 2015 - Jul. 2015</i>
<ul style="list-style-type: none"> <li>Scientific Tools Program for High school</li> </ul>	

## CONFERENCES AND WORKSHOPS

<b>Astroinformatics Conference</b>	<b>Observatory of Capodimonte, Naples, ITALY</b>
<i>Talk</i>	<i>October 2023</i>
<ul style="list-style-type: none"> <li>Planet Detection via High-Contrast Imaging Using Deep Learning</li> </ul>	
<b>Fourth Chile-Japan Academic Forum</b>	<b>Region de los Lagos, CHILE</b>
<i>Short Talk</i>	<i>December 2022</i>
<ul style="list-style-type: none"> <li>ASTROMER: A transformer-based embedding for the representation of light curves</li> </ul>	
<b>Statistical Challenges in Modern Astronomy VII</b>	<b>Virtual</b>
<i>Poster Presentation</i>	<i>May 2021</i>
<ul style="list-style-type: none"> <li>The effect of phased recurrent units in the classification of multiple catalogs of astronomical lightcurves</li> </ul>	

## LANGUAGES

- Spanish: First language
- English: Intermediate

## Publications

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Rodrigo Carrasco-Davis, Guillermo Cabrera-Vives, Francisco Förster, Pablo A Estévez, Pablo Huijse, Pavlos Protopapas, Ignacio Reyes, Jorge Martínez-Palomera, and **Donoso, Cristóbal**. Deep learning for image sequence classification of astronomical events. *Publications of the Astronomical Society of the Pacific*, 131(1004):108006, 2019.

F Förster, G Cabrera-Vives, E Castillo-Navarrete, PA Estévez, P Sánchez-Sáez, J Arredondo, FE Bauer, R Carrasco-Davis, M Catelan, F Elorrieta, et al. The automatic learning for the rapid classification of events (alerce) alert broker. *The Astronomical Journal*, 161(5):242, 2021.

Daniel Moreno-Cartagena, Guillermo Cabrera-Vives, Pavlos Protopapas, **C. Donoso-Oliva**, Manuel P’erez-Carrasco, and Martina C’adiz-Leyton. Positional encodings for light curve transformers: Playing with positions and attention. 2023.

P Sánchez-Sáez, Hernan Lira, Luis Martí, Nayat Sanchez-Pi, J Arredondo, FE Bauer, A Bayo, G Cabrera-Vives, **Donoso-Oliva, C**, PA Estévez, et al. Searching for changing-state agns in massive data sets. i. applying deep learning and anomaly-detection techniques to find agns with anomalous variability behaviors. *The Astronomical Journal*, 162(5):206, 2021.

**Donoso-Oliva, C**, I Becker, P Protopapas, G Cabrera-Vives, Harsh Vardhan, et al. Astromer: A transformer-based embedding for the representation of light curves. *Astronomy & Astrophysics*, 2022.

**Donoso-Oliva, C**, G Cabrera-Vives, P Protopapas, R Carrasco-Davis, and PA Estevez. The effect of phased recurrent units in the classification of multiple catalogs of astronomical lightcurves. *Monthly Notices of the Royal Astronomical Society*, 2021.