Eduardo Antonio Cisternas Jiménez

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Education

Doctor of Philosophy: Medical Physics *August 2018 - date*
Major: Radiation Therapy track
Graduate certificate: Innovation & Entrepreneurship
Graduate certificate: Global Health
Duke University, The Graduate School, The United States of America

Master of Science: Clinical Medical Physics *March 2013 - August 2015*
Heidelberg University, Medical Faculty, Germany

Master of Science: Medical Physics *March 2013 - August 2015*
Pontifical Catholic University of Chile, Faculty of Physics
Graduated with maximum distinction

Bachelor degree of Science: Physics *March 2010 - December 2012*
Pontifical Catholic University of Chile, Faculty of Physics
Graduated with maximum distinction

Bachelor degree of Science: *March 2009 - December 2012*
Natural Sciences and Mathematics
Major: Economics, **Minor:** Fundamental Physics
Pontifical Catholic University of Chile

Research Experience

Doctoral Thesis *August 2018 - Present*
Department of Radiation Oncology, Duke University School of Medicine, North Carolina, USA.
Title: Development of artificial intelligence for automated parameter optimization of inverse treatment planning.
Supervisor: Fang-Fang Yin, Ph.D., Professor in Radiation Oncology at Duke University.

Master's Thesis *August 2014 - February 2015*
Department of Medical Physics in Radiation Oncology, German Cancer Research Center (DKFZ), Heidelberg, Germany.
Title: Development of a multimodality open source treatment planning system.
Supervisors: Mark Bangert, Ph.D., group leader of optimization algorithms group at German Cancer Research Center (DKFZ) and Edgardo Dörner, Ph.D., assistant professor at Faculty of Physics, Pontifical Catholic University of Chile.

Bachelor's Thesis *June 2012 - January 2013*
Department of Physics, Pontifical Catholic University of Chile, Santiago, Chile.
Title: Monte Carlo simulation of an x-ray volume imaging cone beam CT on Elekta XVI
Supervisor: Beatriz Sanchez Nieto, Ph.D., associate professor at Faculty of Physics, Pontifical Catholic University of Chile.

Work Experience

The University Center of Exemplary Mentoring (UCEM) at Duke *July 2022 - date*
Graduate Administrative Intern
As an intern, I assisted Duke UCEM's main effort, which is to increase the diversity of the campus research community by recruiting and supporting Ph.D. students from underrepresented minorities in engineering and the physical sciences. I supported the day-to-day operations of the Duke UCEM, such as: organizing various events, holding check-ins with the Sloan Scholars, and conducting assessments of various aspects of the UCEM.
https://duke.is/9edmh

LATAM Airlines *December 2016 - June 2018*

Senior Business Data Scientist

I was responsible for collecting large amounts of data using analytical, statistical, and programmable skills. My responsibility was to use data to develop software tailored to meet the organization's unique needs. I developed an AI algorithm for bank reconciliation purposes. The finance department at LATAM airlanes has to match the balances in an entity's accounting records for cash and credit card accounts to the corresponding information on several bank statements of thousands of monthly transactions. The time to perform this process decreased from 2 months to 8 hours using my algorithm.

ECONlink Consulting LLC *August 2016 - December 2016*

Economic Consultant

I was responsible for analyzing data statistics and market conditions that affect the performance of the production and manufacturing processes for EMDEPES (a Fishery company based in Chile). I developed business plans to address economic difficulties based on research and data methodologies. I was in charge of writing reports for the chief economist's reference and discussing sales forecasts and the availability of resources depending on the market changes, especially in helping the organization identify opportunities in the long run that would generate more revenues and profits.

Scholarships and Awards

Massachusetts Institute of Technology (MIT) Innovator Under 35 award *December 2019*

The Innovators Under 35 is a peer-reviewed annual award published by MIT Technology Review magazine, naming the world's top 35 innovators under the age of 35. Since 1999, MIT Technology Review has honored the young innovators whose inventions and research are the most exciting. Innovators Under 35 is a list of technologists and scientists, all under the age of 35, whose work is changing the world. The list recognizes the development of new technology or the creative application of existing technologies to solve global problems in industries such as biomedicine, computing, communications, energy, materials, software, transportation, web, and the internet.
`https://www.innovatorsunder35.com/the-list/eduardo-cisternas/`

Chilean Agency for Research and Development - Conference trip award *September 2019*

It is aimed for Chileans studying abroad who present a paper or give a talk at a conference held in Chile. I was awarded for attending the 24^{th} International Conference on Medical Physics, which took place in Santiago, Chile, on 8-11 September 2019.

Ph.D. Fulbright scholarship *August 2018 - August 2022*

Under the Fulbright Program, competitive students are selected to study, conduct research, or exercise their talents at U.S. research institutions. The program was established to increase mutual understanding between the people of the United States and other countries through the exchange of persons, knowledge, and skills. Today, the Fulbright Program is considered the largest and most prestigious educational exchange program worldwide. It is sponsored by The U.S. Department of State's Bureau of Educational and Cultural Affairs.

Becas Chile Ph.D. scholarship *August 2018 - August 2022*

It is a government-sponsored scholarship program, encourages prospective Chilean students to pursue a master's degree or Ph.D. at any of the top 100 universities in the world. It aims to contribute to Chile's innovation and competitiveness.

Best presentation by the International Organization of Medical Physics *June 2015*

Prize for the best presentation by the International Organization of Medical Physics (IOMP): "matRad: a multimodality open source treatment planning toolkit". World Congress in Medical Physics and Biomedical Engineering 2015 (Toronto, Canada).

Prize J.R. Cunningham for young investigators *June 2015*

Third place over 1600 papers, for the best presentation by the International Organization of Medical Physics (IOMP) and the price Jack Cunningham by the Canadian Organization of Medical Physics (COMP/OCMP) by the work: "matRad: a multimodality open source tratment planning toolkit". World Congress in Medical Physics and Biomedical Engineering 2015 (Toronto, Canada).
`https://duke.is/2yda8`

Baden-Württemberg scholarship *August 2014 - April 2015*

The Baden-Württemberg foundation.
The scholarship provides financial support for qualified international students to study at a university in

the state of Baden-Württemberg, Germany. The program funds international stays of up to 11 months. The scholarship was used to participate in the Department of Medical Physics in Radiation Oncology at the German Cancer Research Center (DKFZ) for my Master's thesis research.

Master Clinical Medical Physics scholarship *March 2014 - July 2014*

DAAD - Heidelberg Universität

Full tuition scholarship for the Master program "Clinical Medical Physics", offered by Heidelberg University. The scholarship was sponsored by the German Academic Exchange Service (DAAD - Deutscher Akademischer Austauschdienst). Awarded to the two top students

Deparment of Physics scholarship *March 2013 - December 2014*

Pontifical Catholic University of Chile.

Half tuition scholarship for the M.Sc. degree in "Medical Physics", at Pontifical Catholic University of Chile. The scholarship was financed by "Vicerrectoría Académica UC" and awarded to competitive students at the top of the applicant pool with respect to academic achievement. In addition to academic criteria, candidates' talent, perseverance, innovation, involvement and leadership are considered.

San Andrés scholarship *March 2013 - December 2014*

Pontifical Catholic University of Chile.

Half tuition scholarship for a Master's degree. It was awarded to the top four over 200 students who graduated from the B.Sc in Natural Sciences and Mathematics program at Pontifical Catholic University of Chile.

Double Degree scholarship *March 2010 - December 2012*

Pontifical Catholic University of Chile.

Full tuition scholarship for B.Sc. in Physics. The scholarship is awarded to students with academic merit who want to study two degrees simultaneously: Physics & Economics.

Presentations

Invited talks

MIT Innovators Under 35 LATAM *January 30th, 2020*

Parque BBVA Polanco, Mexico City, Mexico

Development of MatRad, Open Source Treatment Planning System

Participation as speaker

Conferences & Workshops

AAPM 64th Annual Meeting *July 10th - 14th , 2022*

Washington, DC

E. Cisternas Jimenez, Fang-Fang Yin, IMRT Plans Guided by Novel Artificial Intelligence Neuro-Fuzzy Algorithm

Participation as poster

24th International Conference on Medical Physics - IOMP *September 8th - 11th, 2019*

Santiago, Chile

E. Cisternas Jimenez, Fang-Fang Yin, The use of Dynamic membership functions on IMRT plans

Participation as poster

The Falling Wall Chile contest - Finalist *September 22th, 2016*

The Falling Walls Lab Chile is hosted by the Fundación Ciencia Joven in collaboration with the German Academic Exchange Service and supported by the Federal Foreign Office of Germany. Participants will pitch their ideas in front of a distinguished jury in only 3 minutes each. The challenge of the format lies in its brevity.

Participation as speaker

5th Summer School, Medical Physics in Radiotherapy *November 5th - 14th, 2015*

The Heidelberg Center for Latin America and the Pontifical Catholic University of Chile.

Three-day workshop on Brachytherapy and one-day clinical workshop at Alemana Clinic, Santiago, Chile.

Participation as speaker

World Congress in Medical Physics and Biomedical Engineering *June 7th - 12th, 2015*

Metro Toronto Convention Center, South Building, Toronto, Ontario, Canada.

Title: matRad - a multimodality open source 3D treatment planning toolkit.

Participation as speaker

Workshop Physics of novel radiotherapy techniques *June 24th - 25th, 2014*
Pontifical Catholic University of Chile and Heidelberg Center for Latin America.
Participation as poster

XIV Chilean national congress of radiation oncology *March 26th - 29th, 2014*
National Park Huilo Huilo.
Title: Monte Carlo Simulation: X-ray tube for cone beam computed tomography.
Participation as poster

Whorkshop: The Physics of advanced radiotherapy techniques: The role of medical images *January 28th - 31th, 2014*
Pontifical Catholic University of Chile
Title: Monte Carlo Simulation: X-ray tube for cone beam computed tomography
Participation as poster

VI Congress of Latin American Association of Medical Physics *August 24th - 27th, 2013*
RIU hotel, Guanacaste, Costa Rica.
Title: Monte Carlo Simulation: X-ray tube for cone beam computed tomography
Participation as speaker

Publications

Hans-Peter Wieser, **Eduardo Cisternas**, Niklas Wahl, Silke Ulrich, Alexander Stadler, Henning Mescher, Lucas-Raphael Müller, Thomas Klinge, Hubert Gabrys, Lucas Burigo, Andrea Mairani, Swantje Ecker, Benjamin Ackermann, Malte Ellerbrock, Katia Parodi, Oliver Jäkel and Mark Bangert. Development of the open-source dose calculation and optimization toolkit matRad. Medical Physics, 2017 Apr 1. DOI:10.1002/mp.12251.

E. Cisternas Jiménez, B. Sánchez Nieto, E. Dörner Yaksic. Simulación Monte Carlo de un Sistema de Rayos-X para tomografía computarizada de haces cónicos (CBCT). Latin American Journal of Medical Physics, [S.l.], v. 2, n. 2, p. 05, apr. 2016. ISSN 2413-9904.
http://revistaalfim.org/index.php/revistaalfim/article/view/43

E. Cisternas, A. Mairani, P. Ziegenhein, O Jäkel, and M. Bangert. matRad - a multi-modality open source a 3D treatment planning toolkit. pages 1608-1611, 2015. Proceedings of the IUPESM World Congress on Medical Physics and Biomedical Engineering in Toronto. DOI:10.1007/978-3-319-19387-8_391

Instruction

Lecturer

Universidad Mayor, Faculty of Engineer *March 2017 - July 2017*
Renewable energy, Experimental methods, and Heat transfer: Undergraduate courses for Engineering students

Pontifical Catholic University of Chile, Faculty of Physics *August 2016 - December 2016*
Physics for scientists: Undergraduate course for Biology, Biochemistry and Chemistry students

DUOC UC community College *March 2016 - July 2016*
Mathematics and Physics: Undergraduate course

Pontifical Catholic University of Chile *January 2016*
General Physics: Undergraduate course for Physics students

Teaching Assistant

Duke University
Radiation Protection *Spring 2021, Fall 2020*

Pontifical Catholic University of Chile
Monte Carlo techniques in radiotherapy *Spring 2015*
Physics for Medicine *Spring 2015*
Thermodynamics *Spring 2015*
Leveling in Physics for Engineers *Spring 2014, Fall 2013*
Calculus I for economists *Spring 2014, Spring 2013*

Algebra	*Spring 2013, Spring 2012*
Introduction to Calculus	*Fall 2012, Spring 2010*
Algebra and Introduction to Calculus	*Fall 2011, Spring 2011*
Calculus I	*Summer 2011*
Algebra	*Fall 2010*
Physics for scientists	*Fall 2010*

Los Lagos University

Calculus I	*Spring 2009, Fall 2008, Spring 2008, Spring 2007, Fall 2006*
Algebra	*Spring 2009, Fall 2008*
Calculus II	*Spring 2009, Spring 2007*
Geometry	*Spring 2008*
Linear Algebra	*Spring 2007*

Laboratory Assistant

Pontifical Catholic University of Chile

Thermodynamics	*Fall 2015, Spring 2015, Fall 2012*
Electricity and Magnetism for Engineering	*Fall 2015, Spring 2013*
Physics I (Kinematics and Dynamics)	*Fall 2015, Fall 2011*
Physics for scientists	*Spring 2014, Spring 2012, Fall 2008, Fall 2007*
Static and dynamic	*Fall 2013*
Physics II (Electricity and Magnetism)	*Spring 2010*

Adolfo Ibañez University

Classical mechanics	*Spring 2013*
Electromagnetism	*Fall 2012*

Languages

Spanish: Native speaker

English: Fluent

Computer skills

Operating Systems

Linux, Windows, Mac OSX.

Scientific Software

MATLAB, Maple, TensorFlow, Mathematica, Stata, Origin, Qtiplot, Montecarlo Beam NRC, Slurm (Super Computer Workload Manager)

Radiation Oncology Software

VARIAN Eclipse, VARIAN Esapi, 3D Slicer, ITK-SNAP

Computer Administration and Productivity Software

LaTeX, Office, Joomla, WordPress, Apache server, MySQL.

Scripting/Programming

Python, C, C++, Java, Bash, HTML.

Leadership

President *2020*

Duke's Medical Physics Graduate Program Student Leadership and Advisory Council

Group of students who help to address issues such as academic programs and curricula, professional development, and long-range goals of the program

References

Rafael Benguria, Ph.D. full professor at Faculty of Physics, Pontifical Catholic University of Chile
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Last update: December 13, 2022