09/07/2025

ODETTE RIOS IBACACHE

odette.riosibacache@mail.mcgill.ca ◇ https://odetteriosi.github.io/

I am an international Physics PhD student at McGill University, specializing in Medical Physics. I am from Chile, specifically from San Bernardo, Santiago. A lovely rural town where you can see horses and cars in the street! I am passionate about the role of AI in healthcare. My current research focuses on advancing scalable AI for medical imaging in radiotherapy, with an emphasis on interoperability and data integration for multicentre studies. I am also keen on education and science communication, being very active in outreach activities.

EDUCATION

McGill University September 2024 - Present, Montreal, Canada
Ph.D. Physics Student (Medical Radiation Physics Concentration).

McGill University September 2022 - August 2024, Montreal, Canada
M.Sc. in Medical Radiation Physics. GPA: 3.97/4.00

- Thesis Title: “Development of geometrical parameters to describe anatomical changes and predict the need for radiotherapy replanning in head and neck cancer patients"
  Supervisor: Prof. John Kildea

Pontificia Universidad Católica de Chile (PUC) March 2017 - July 2021, Santiago, Chile
Licenciatura en Física (Licentiate degree in Physics). GPA: 6.4/7.0 (eq. GPA: 3.99/4.00)

- Thesis Title: “Development of a model based on magnetic resonance images information and automatic learning tools to predict risk group of prostate cancer”
  Supervisor: Prof. Paola Caprile, Co-Supervisor: Prof. Domingo Mery

AWARDS AND SCHOLARSHIPS/FELLOWSHIPS

- **Bourse de doctorat en recherche B2X (2025 - 2029)**: *Fonds de recherche du Québec – Santé (FRQS)*
- **Best Poster Presentation Award at the Cancer Translational Research Horizons 2024 event**
- **Rising Stars Poster Competition at the XXth International Conference on the use of Computers in Radiation therapy (ICCR 2024)**: *Third Place*
- **2024 AAPM/RSNA Doctoral Fellowship:** Granted by the American Association of Physicists in Medicine (AAPM). This fellowship is given to two first-year doctoral students.
- **Science Slam Competition at 5th DKFZ Summer School in Medical Physics 2023: Data Science and Machine Learning in Radiotherapy**: *Second Place*
- **RI-MUHC Studentship 2023**: *Granted by Research Institute McGill University Health Centre (RI-MUHC) from January to December 2023*
- **Graduate Excellence Fellowship Award 2023 and 2022**: *Granted by the Medical Physics Unit, McGill University, to highly qualified students who are registering in the Medical Physics Graduate Program.*
- **Differential Fee Waiver for International Students Award**: *Granted by McGill University for the first academic year, Faculty of Medicine. It exempts students from international tuition supplements and allows them to have tuition fees equal to those of a Quebec resident student.*
- **Summer Physics Research Fellowship**: *Month stipend granted by the Department of Physics at the Pontificia Universidad Catolica de Chile.*
- **Padre Hurtado Award**: *Full tuition fee waiver, granted by the Pontificia Universidad Católica de Chile for undergraduate studies, corresponded to the academic years from 2017 to 2021. This award is granted to students who come from a low-income background and achieved high performance on the University Selection Test (PSU: Prueba de Seleccion Universitaria).*
- **Bicentenario Scholarship**: *Partial tuition fee waiver for higher education students who had a high academic performance in high school and are from low-income backgrounds. Granted by the Government of Chile, for academic years from 2017 to 2021.*
- **Presidente de la República Scholarship**: *Monthly stipend granted by the Government of Chile from 2015 until 2017. This scholarship is granted to students in high-vulnerability economic conditions with high academic performance.*

MEMBERSHIPS OF PROFESSIONAL SOCIETIES

- Canadian Organization of Medical Physicists (COMP)
- American Association of Physicists in Medicine (AAPM)
- Association Québécoise des Physicien(ne)s Médicaux Cliniques (AQPMC)

RESEARCH EXPERIENCE

McGill University September 2024 - Present
PhD Research Student
“Development of an mCODE-compliant knowledge base for glioma digital twins in radiotherapy"

- Development of a radiomics feature-extractor module mCODE-extension to build a Knowledge Base and Digital Twins for patients diagnosed with gliomas and predict their treatment outcomes using artificial intelligence tools, specially tumour recurrence.

Supervisor: Dr. John Kildea, Co-Supervisor: Dr. Amal Zouaq

McGill University May 2023 - August 2024

Master Research Student

"Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer"

- Definition of geometrical metrics to describe and quantify anatomical changes that head and neck cancer patients experience throughout radiotherapy treatment, and development of a Machine Learning model based on the metrics to predict if treatment replanning is needed.

Supervisor: Dr. John Kildea

Pontificia Universidad Católica de Chile January 2022 - July 2022

iHealth Group - Millennium Institute for Intelligent Healthcare Engineering

Research Assistant

"Automatic segmentation of prostate lesions using machine and deep learning tools based on MRI series."

- Development of an artificial intelligence model to automatically segment intraprostatic lesions in Magnetic Resonance Images of patients diagnosed with prostate cancer. iHealth Group is a national scientific research collaboration between Chilean universities to improve healthcare using AI.

Supervisor: Dr. Domingo Mery, Co-supervisor: M.D. Cecilia Besa

Pontificia Universidad Católica de Chile March 2020 - July 2022

Undergraduate Research Student

"MRI-based surrogate imaging markers of aggressiveness in prostate cancer"

- Creation of a pipeline to extract Radiomic feature information from intraprostatic lesions found in prostate bi-parametric Magnetic Resonance Images (bpMRI), doing comprehensive statistical analysis, and building a Machine Learning model to predict the aggressiveness group for patients diagnosed with prostate cancer based on Gleason Score. This research was part of the National Fund for Scientific and Technological Development (FONDECYT) of Chile.

Supervisor: Dr. Paola Caprile, Co-supervisor: M.D. Cecilia Besa

Pontificia Universidad Católica de Chile - Instituto de Física January 2019

Undergraduate Research Student (Summer Full Time Internship)

"Fabrication of nanohybrid structures using porous alumina membranes"

- Summer internship in the field of nanotechnology. The project was based on the fabrication of hybrid nanostructures using porous alumina membranes. The aim was to design a new protocol and method to make the pores larger for electrical applications by using different chemicals (such as perchloric acid) and an anodization process.

Supervisor: Dr. Samuel Hevia

CLINICAL SHADOWING EXPERIENCE

Radiotherapy Medical Physics Shadowing

- Observed daily, monthly, and annual QA processes for radiotherapy machines and treatment planning for head and neck, breast, and stereotactic procedures at McGill University Health Centre (2 sessions).

Brachytherapy Medical Physics Shadowing

- Observed brachytherapy procedures (two lung cancer treatment cases) during 2 dedicated sessions at McGill University Health Centre.

PUBLICATIONS, RESEARCH PRESENTATIONS, AND OTHERS

Peer-reviewed Scientific Publications

- **Rios-Ibacache O.**, Manalad J., O'Sullivan-Steben K., Poon E., Galarneau L., Khriguian J., Shenouda G., & Kildea J. "Quantification of head and neck cancer patients' anatomical changes: prediction of radiotherapy replanning need". *Manuscript submitted and under peer-review for the Journal of Applied Clinical Medical Physics*. **Pre-print available in arXiv**. https://doi.org/10.48550/arXiv.2507.13630.
- Dominguez J†., **Rios-Ibacache O†.**, Caprile P., Gonzalez J., San Francisco I.F. & Besa C. "MRI-Based Surrogate Imaging Markers of Aggressiveness in Prostate Cancer: Development of a Machine Learning Model Based on Radiomic features". **Diagnostics 2023**, 13, 2779. https://doi.org/10.3390/diagnostics13172779. **(† co-first authorship)**.
- **Rios-Ibacache, O.,** et al. (2025). Conference Abstract. "Towards the development of an mCODE radiomics-dosiomics extension and knowledge base for radiotherapy." **Medical Physics**, 52 (8), e18073. https://doi.org/10.1002/mp.18073.
- **Rios-Ibacache, O.,** et al. (2024). Conference Abstract. "Development and evaluation of novel parameters for describing anatomical changes and predicting radiotherapy replanning for head and neck cancer patients". Published in **HAL**. Proceedings of the XX-th international conference on the use of computers in radiation therapy (ICCR). pp. 361-354. https://hal.science/hal-04720234
- O'Sullivan-Steben K., **Rios-Ibacache, O.**, et al. (2024). Conference Abstract. "A pipeline for generating longitudinal head and neck cancer radiotherapy datasets for machine learning". Published in **HAL**. Proceedings of the XX-th international conference on the use of computers in radiation therapy (ICCR). pp. 484-487. https://hal.science/hal-04720234

- **Rios-Ibacache O.,**. et al. (2024). Conference Abstract. “Development of geometrical parameters for characterizing anatomical alterations in head and neck cancer patients and evaluating radiotherapy replanning”. **Medical Physics**, 51(8), 5785-5835. pp. 10. https://doi.org/10.1002/mp.17344
- **Rios-Ibacache, O.,** et al. (2024). MSc thesis, McGill University. “Development of geometrical parameters to describe anatomical changes and predict the need for radiotherapy replanning in head and neck cancer patients”.
- **Rios-Ibacache O.,** et al., (2022). Conference Proceedings. “Development of an MRI radiomic-based ML model to predict the aggressiveness of prostate cancer”. **ESTRO2022**. Elsevier. 17. 10.1016/s0167-8140(22)03731. Proceeding PO-1767.
- Dominguez I., Caprile P., **Rios-Ibacache O.,** et al. (2022). Conference Abstract. “Development of a MRI radiomic-based ML model to predict aggressiveness of prostate cancer". **International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting**. Proceeding Abstract #4004.

Oral Research Presentations (International: 2. National: 2. Provincial: 2. Institutional: 8; **Total: 14**)

- **Rios-Ibacache, O.,** et al. (2025). “From Fragmented to Connected: Towards the development of an mCODE radiomics-dosiomics extension and knowledge base for radiotherapy". **Young Investigator Symposium 71st COMP Annual Scientific Meeting**. *Top-rated abstracts from up-and-coming medical physics investigators*. Held on June 4th-7th, 2025. (National)
- **Rios-Ibacache, O.,** et al. (2025). “Towards the development of an mCODE radiomics-dosiomics extension and knowledge base for radiotherapy". **IDIGH/CRP Joint Research Day 2025**. Held on May 14th, 2025. (Institutional)
- **Rios-Ibacache, O.,** et al. (2025). “Development of a Radiomics-Dosiomics mCODE extension for radiotherapy". **Invited Speaker at the COMP Research Discovery Seminar Series**. (International)
- **Rios-Ibacache, O.,** et al. (2025). “Towards the development of an mCODE radiomics-dosiomics extension and knowledge base for radiotherapy”. Friday Morning Talk presentation at the Medical Physics Unit (MPU), McGill University. (Institutional).
- **Rios-Ibacache, O.,** et al. (2024).“Towards the quantification of anatomical changes in head and neck cancer patients”. **Science des données responsable dans le domaine de la santé annual retreat 2024**. (Provincial).
- **Rios-Ibacache, O.,** et al. (2024). “Development of geometrical parameters for characterizing anatomical alterations in head and neck cancer patients and evaluating radiotherapy replanning”. **70th COMP Annual Scientific Meeting (ASM)**, 2024. (National).
- **Rios-Ibacache, O.,**, et al. (2024). “Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer”. McGill Medical Physics Friday Morning Talk. Montreal. (Institutional).
- **Rios-Ibacache, O.,** et al. (2024).“Development and evaluation of novel parameters for describing anatomical changes and predicting radiotherapy replanning for head and neck cancer patients”. **3rd annual Celebration of Research and Training in Oncology (CORTO) 2024**, May 2024. **Top 10 Best Student Research Abstracts**. (Institutional)
- **Rios-Ibacache, O.,** et al. (2023).“Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer”. Research Presentation at the Scientific Congress 2023 hosted by **Association Quebecoise des Physicien(ne)s Medicaux Cliniques (AQPMC)**. (Provincial).
- **Rios-Ibacache, O.,** et al. (2023).“Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer". Friday Morning Talk presentation at Medical Physics Unit, McGill University. (Institutional).
- **Rios-Ibacache, O.,** et al. (2023).“Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer”. Science Slam competition in the 5th International Summer School in Medical Physics 2023: Data Science and Machine Learning in Radiotherapy, hosted by the **German Cancer Center (DKFZ)**. (International).
- **Rios-Ibacache O.,** et al. (2022). “On the study of Prostate Cancer using AI tools and MRI series”. Research Presentation in **PizzaSeminar Series 2022** at Jorge Krause Auditorium of Pontificia Universidad Catolica de Chile, Santiago de Chile. Faculty of Physics. (`https://youtu.be/N_9-nshU-4U`). (Institutional).
- **Rios-Ibacache O.** (2021). “Development of a model based on magnetic resonance image information and automatic learning tools to predict the risk group of prostate cancer”. Bachelor Research Thesis Presentation/Defense at Pontificia Universidad Catolica de Chile, Santiago de Chile. (Institutional).
- **Rios-Ibacache O.** (2019). “Fabrication of alumina membranes of 150 - 200 nm diameter”. Internship Research Presentation at Jorge Krause Auditorium of Pontificia Universidad Catolica de Chile, Santiago de Chile. (Institutional).

Poster Research Presentations (International: 4. National: 0. Provincial: 2. Institutional: 3; **Total:9**)

- **Rios-Ibacache O.** et al. (2025). “Development of a Radiomics-Dosiomics mCODE ontology extension for radiotherapy". Therapy General Poster Discussion presented at the **American Association of Physicists in Medicine (AAPM) Annual Meeting 2025**. (International).
- **Rios-Ibacache O.** et al. (2025). “Towards the development of an mCODE radiomics-dosiomics extension and knowledge base for radiotherapy". Poster presented at the **4th annual Celebration of Research and Training in Oncology (CORTO) 2025**. (Institutional).

- Pater P., O'Sullivan-Steben K., **Rios-Ibacache O.** et al. (2025). "Beyond Traditional Evaluation: A Student-Centered Approach in Medical Physics Graduate Programs". Poster at the **Richard and Sylvia Cruess Symposium on Scholarship in Health Sciences Education event**. April 2025. (Institutional).
- **Rios-Ibacache O.,** et al. (2024). "Towards the quantification of anatomical changes in head and neck cancer patients to evaluate radiotherapy replanning". **RI-MUHC 2030 Vision: A Day of Discovery event**. November 2024. (Institutional).
- **Rios-Ibacache O.,** et al. (2024). "Towards the quantification of anatomical changes in head and neck cancer patients to evaluate radiotherapy replanning". **Cancer Translational Research Horizons 2024 event**. November 2024. (Provincial).
- **Rios-Ibacache O.,** et al. (2024). "Development and evaluation of novel parameters for describing anatomical changes and predicting radiotherapy replanning for head and neck cancer patients". **XXth International Conference on the use of Computers in Radiation Therapy (ICCR) 2024**. (Poster as part of the **Young Rising Stars Competition, top 20 abstracts**). (International).
- O'Sullivan-Steben K., **Rios-Ibacache O.,** et al. (2024). "A Pipeline for Generating Longitudinal Head and Neck Cancer Radiotherapy Datasets for Machine Learning". **ICCR 2024**. (International).
- **Rios-Ibacache O.,** et al. (2023). "Development and evaluation of a novel artificial intelligence model to predict radiotherapy replanning for head and neck cancer". **Science des données responsable dans domaine de la santé annual retreat 2023**. (Provincial).
- **Rios-Ibacache O.,** et al. (2022). "Development of an MRI radiomic-based ML model to predict the aggressiveness of prostate cancer". **ESTRO2022**. (International).

TEACHING EXPERIENCE

Note that in **Chile** the Fall term is from mid-March to mid-July, while the Spring term is from August to December. The Summer term corresponds to only January (full-time work).

Teaching Assistant at McGill University 2024-2025

- **Laboratory of Radiotherapy Physics (MDPH603)**: *Winter 2025*
- **Radiotherapy Physics (MDPH602)**: *Winter 2025 (I taught a full lecture)*
- **Radiation Physics (MDPH601)**: *Fall 2024, Fall 2025*

Teaching Assistant at Pontificia Universidad Católica de Chile 2018-2022

- **Precalculus (MAT1000)**: *Fall 2022*
- **Linear Algebra (MAT1203)**: *Fall 2022*
- **Calculus 1 - Differential Calculus (MAT1610)**: *Fall 2022 and Summer 2022*
- **Dynamics (FIS1514)**: *Spring 2021, Fall 2022*
- **Introduction to Mathematics (PIMUB)**: *Fall 2020*
- **Calculus 2 - Series and Multivariable Differential Calculus (MAT1620)**: *Fall 2019, Spring 2020, Summer 2020, Fall and Spring 2021*
- **Statics and Dynamics (FIS1513)**: *Spring 2018*

Laboratory Assistant at Pontificia Universidad Católica de Chile 2018-2022

- **Laboratory of Electricity and electromagnetism (FIS0153)**: *Spring 2021*
- **Calculus 3 - Vector Calculus (MAT1630)**: *Fall 2022*
- **Electricity and electromagnetism (FIS1533)**: *Fall 2021*
- **Laboratory of Calculus 1 - Differential Calculus (MAT1610L)**: *Fall and Spring 2020, Fall 2022*
- **Laboratory of Calculus 3 - Vector Calculus (MAT1630L)**: *Spring 2019, Fall 2022*
- **Laboratory of Differential Equations (MAT1640L)**: *Spring 2019, Fall 2020*
- **Laboratory Calculus 2 - Series and Multivariable Differential Calculus (MAT1620L)**: *Spring 2018, Spring 2020, Fall and Spring 2021, Fall 2022*

TECHNICAL SKILLS

Programming Languages: Wolfram Mathematica, Python, SQL, Fortran, LaTeX, R, HTML
Medical Imaging Tools: 3D Slicer, Medical Image Merge (MIM) Maestro, Varian Treatment Planning System

LANGUAGES

Spanish (Native/Fluent) English (Professional Working Proficiency), French (Elementary Proficiency), Portuguese (Elementary Proficiency)

LEADERSHIP, OUTREACH AND SERVICE

Representative (Liaison) between COMP Student Council and COMP CWC-IDEA September 2025 - Present
• COMP Women's Committee - Inclusion, Diversity, Equity, and Accessibility (CWC-IDEA) aims to identify, address, and monitor issues facing women and other equity-deserving individuals working in or studying medical physics in Canada.

Research Discovery Seminar Co-lead September 2025 - Present
• Co-lead organizer of the Research Discovery Seminars organized by COMP Student Council. During these seminars, selected Canadian students present their research in a national level.

Member of the Canadian Organization of Medical Physicists (COMP) Student Council September 2025 - Present
• Sub-committee of the COMP Science and Education Committee. The main objectives are to advise the COMP Board through the Science and Education Committee on matters of importance to COMP student members.

President of the McGill Medical Physics Student Council September 2025 - Present
• President of the Medical Physics students council, which links instructors and students and promotes a sense of community by planning departmental activities and events.

McGill Centre for Translating Cancer Research (MCTRC) Podcast June 2025 - Present
• MCTRC Students interviews experts from all corners of the field, including fundamental researchers, clinicians, industry professionals, and patient advocates. Our mission is to demystify the translational research process, highlight key challenges, and inspire students to actively engage in shaping their careers in this field.

Medical Physics Unit Annual Retreat Committee Planning May 2025 - June 2025
• Organizing committee member of the annual retreat within the Medical Physics Unit. In charge of the social and EDI activities.

Student Lead Coordinator in CORTO event organization March 2025 - May 2025
• Volunteering at the Celebration of Research and Training in Oncology (CORTO) event, specifically in the organization or activities for the trainee corner.

Science Communicator in Social Media (@100tificosxElMundo) February 2025 - Present
• Creator and co-manager of the social media account "@100tificosxElMundo" where, along with another international student, I share my experience as an international student and interview graduate students and professors.

Judge and Mentor at Physics Hackathon 2024 November 15th - 17th, 2024
• Mentor and judge at the yearly Hackathon event hosted by the Department of Physics at McGill University, which consists of a computer programming competition.

Secretary in the Equity, Diversity & Inclusion (EDI) Committee at the Medical Physics Unit September 2024 - Present
• Duties involve the promotion of awareness of the EDI values through the organization of workshops and talks.

Member of the McGill Medical Physics Student Council September 2024 - Present

Medical Physics Journal Club Coordinator at McGill University September 2024 - July 2025
• Organize weekly departmental student research article reviews, including scheduling, collecting, talk moderation, and audio-visual setup and troubleshooting.

VP Communications the Cancer Research Program Trainee Council within the Research Institute of McGill University Health Centre September 2024 - June 2025

• Student representative among the CRP students (Medical Physics is part of the CRP program at McGill University). Duties include taking meeting minutes of the council meetings, promoting academic and social events, and serving as a communication link with RIMUHC members.

Volunteering at the Physics Outreach Group September 2024 - Present
• The Physics Outreach group from the Department of Physics, McGill University, has the initiative to promote science to the general public in Montreal. We host the annual event titled: *"From Planets to Particles: An Exploration Mini-Fair"*.

Social Media Coordinator in the Cancer Research Program Trainee Council within the Research Institute of McGill University Health Centre October 2023 - August 2024
• Student representative among the CRP students. Duties involve posting on social media about various events organized by the Cancer Research Program Trainee Council (CRP TC). The CRP TC is a student council that arranges activities aimed at enhancing the academic and research skills of cancer research students.

Laurie Hendren Symposium On Patient-in-the-Loop Data August 28th 2024
• Student volunteering in the Laurie Hendren Symposium, which discussed the pros and cons of the patient-in-the-loop data model as well as the barriers and facilitators to implementing it in Quebec.

Judge at Physics Hackathon 2023 November 3rd - 5th 2023
• Judge at the yearly Hackathon event hosted by the Department of Physics at McGill University, which consists of a computer programming competition.

Novatas por un día (female first-year students for a day) at PUC July 2022
• Fair counselor to orient and answer questions related to the undergraduate program in Physics at Pontificia Universidad Católica de Chile. This was a whole-day activity related to women in physical sciences and oriented to high school students.

COANIQUEM Burned Center AID for Children Foundation 2021 - July 2022
• Volunteering to share knowledge and raise awareness about burn injuries, particularly in children, through social media (social marketing).

Teletón Chile October 2021 - December 2021
• Social marketing volunteering to raise money in the yearly Teleton fundraising event in Chile. The money raised goes to the Teleton Institute (rehabilitation centers), which gives treatment to people with physical disabilities.

Virtual Exposition for Future Prospective Students 2022 at PUC October 2021
• Ambassador at a virtual fair to orient high school students and answer questions related to the undergraduate program in Physics at Pontificia Universidad Católica de Chile.

Fundación Nuestros Hijos October - November 2021
• Volunteering to raise money for Fundación Nuestros Hijos, which has the goal of covering the cost of treatments against cancer for children from low-income backgrounds.

First-year students welcome at Faculty of Physics PUC January 2018
• Preparing interactive material to welcome the new students of the physics and astrophysics undergraduate program, at the Faculty of Physics at PUC.

Second Version of Scientific Fair at Pontificia Universidad Católica de Chile 2017
• Feria Científica (Scientific Fair) at the Institute of Physics PUC. An activity to promote and motivate science in secondary and high school students in Santiago, Chile, was organized by Professor Donovan Diaz.

Buenas Prácticas UC: Enseñar a otros para aprender Física (Video) 2017
• Participation in a video intended for promoting science, Desarrollo Docente UC (Teaching Development Center). https://youtu.be/pQ2DMWAfUEw.

COANIQUEM Burned Center AID for Children Foundation 2016
• Volunteering to raise money for the Coaniquem Foundation, which has the task of rehabilitating and giving treatment to children with burn injuries.

WORK AND OTHER EXPERIENCES

Test Proctor at Pontificia Universidad Católica de Chile August 2018 - July 2022

Test proctor during the academic year. The activity consists of supervising the students during their exams.

- Facultad de Matemáticas (Faculty of Mathematics)
- Facultad de Física (Faculty of Physics)

Store Assistant at Fashion's Park Store San Bernardo December 2018

HOBBIES AND INTERESTS

Playing music (traverse flute, guitar, piano, learning drums), Creative writing, Drawing and painting