

CARLOS PÉREZ ARANCIBIA

Curriculum Vitae

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Last updated September 20, 2024

RESEARCH INTERESTS

Scientific computing; high-order PDE solvers; fast algorithms; numerical analysis; boundary and volume integral equations; wave phenomena; computational electromagnetics; optical metamaterials.

EMPLOYMENT HISTORY

ASSISTANT PROFESSOR (UD-1, TENURED)	9/21 - Present
Mathematics of Computational Science	
Department of Applied Mathematics	
Faculty of Electrical Engineering, Mathematics and Computer Science	
University of Twente, Enschede, The Netherlands	
ASSISTANT PROFESSOR	7/17 - 8/21
Institute for Mathematical and Computational Engineering	
Pontificia Universidad Católica de Chile, Santiago, Chile	
INSTRUCTOR IN APPLIED MATHEMATICS	9/16 - 6/18
Department of Mathematics	
Massachusetts Institute of Technology, Cambridge, MA, USA	

EDUCATION

CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CA, USA	8/16
· Ph.D. in Applied & Computational Mathematics	
· Thesis supervisor: Oscar P. Bruno	
PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE, SANTIAGO, CHILE	
· Diploma in Mathematical Engineering (with the highest distinction)	5/10
· Master in Engineering Sciences (with the highest distinction)	5/10
· Minor in Philosophy	5/10
· Bachelor in Engineering Sciences	12/08

JOURNAL PAPERS¹

- 27.‡ V. Hojas, [C. Pérez-Arancibia](#) and M. A. Sánchez, *Reflectionless discrete perfectly matched layers for higher-order finite difference schemes*. To appear in SIAM Journal on Scientific Computing, 2024.
- 26.‡ A.-S. Bonnet-Ben Dhia, L. Faria and [C. Pérez-Arancibia](#), *A complex-scaled boundary integral equation for time-harmonic water waves*. SIAM J. Appl. Math., 84.4 (2024), pp. 1532-1556.
- 25.‡ T. G. Anderson, M. Bonnet, L. M. Faria and [C. Pérez-Arancibia](#), *Fast, high-order accurate numerical evaluation of volume potentials via polynomial density interpolation*, J. Comput. Phys., 511 (2024), p. 11309.
- 24.‡ T. G. Anderson, M. Bonnet, L. M. Faria, and [C. Pérez-Arancibia](#), *Construction of polynomial particular solutions of linear constant-coefficient partial differential equations*, Comput. Math. Appl., 162 (2024), pp. 94-103.
- 23.‡ L. Faria, [C. Pérez-Arancibia](#) and C. Turc, *Combined field-only boundary integral equations for PEC electromagnetic scattering problem in spherical geometries*, SIAM J. Appl. Math., 84.1 (2024), pp. 1-38.
- 22.‡ T. Strauszer-Caussade, L. Faria, A. Fernandez-Lado and [C. Pérez-Arancibia](#), *Windowed Green function method for wave scattering by periodic arrays of 2D obstacles*, Stud. Appl. Math., 150.1. (2023), pp. 277-315.

¹Papers marked with the symbol ‡ follow the mathematical tradition of alphabetical authorship ordering, whereas those marked with † denote work with mentored students.

- 21.‡ R. Arrieta and C. Pérez-Arancibia, *Windowed Green function MoM for second-kind surface integral equation formulations of layered media electromagnetic scattering problems*, IEEE Trans. Antennas Propag., 70.12 (2022), pp. 11978-11989.
- 20.‡ V. Gómez and C. Pérez-Arancibia, *On the regularization of Cauchy-type integral operators via the density interpolation method and applications*, Comput. Math. Appl., 87 (2021), pp. 108-119.
19. L. Faria, C. Pérez-Arancibia and M. Bonnet, *General-purpose kernel regularization of boundary integral equations via density interpolation*, Comput. Methods Appl. Mech. Eng., 378 (2021), p. 113703.
18. C. Pérez-Arancibia, C. Turc, L. Faria and C. Sideris, *Planewave density interpolation methods for the EFIE on simple and composite surfaces*, IEEE Trans. Antennas Propag., 69.1 (2021), pp. 317-331.
- 17.‡ D. Nicholls, C. Pérez-Arancibia, and C. Turc, *Sweeping preconditioners for the iterative solution of quasiperiodic Helmholtz transmission problems in layered media*, J. Sci. Comput., 82.44 (2020), pp. 1-45.
- 16.‡ I. Labarca, L. Faria and C. Pérez-Arancibia, *Convolution quadrature methods for time-domain scattering from unbounded penetrable interfaces*, Proc. R. Soc. A, 475.2027 (2019), pp. 1-18.
15. C. Pérez-Arancibia, C. Turc and L. Faria, *Planewave density interpolation methods for 3D Helmholtz boundary integral equations*, SIAM J. Sci. Comput., 41.4. (2019), pp. A2065-A2087.
- 14.‡ C. Pérez-Arancibia, S. Shipman, C. Turc and S. Venakides, *Domain decomposition for quasi-periodic scattering by layered media via robust boundary-integral equations at all frequencies*, Commun. Comput. Phys., 26 (2019), pp. 265-310.
13. C. Pérez-Arancibia, L. Faria and C. Turc, *Harmonic density interpolation methods for high-order evaluation of Laplace layer potentials in 2D and 3D*, J. Comput. Phys., 376 (2019), pp. 411-434.
12. R. Pestourie, C. Pérez-Arancibia, Z. Lin, W. Shin, F. Capasso and S. G. Johnson, *Inverse design of large-area metasurfaces*, Opt. Express, 26.26. (2018), pp. 33732-33747.
11. C. Pérez-Arancibia, R. Pestourie and S. G. Johnson, *Sideways adiabaticity: Beyond ray optics for slowly varying metasurfaces*, Opt. Express, 26.23. (2018), pp. 30202-30230.
10. C. Pérez-Arancibia, E. Godoy and M. Durán, *Modeling and simulation of an acoustic well stimulation method*, Wave Motion, 77 (2018), pp. 214-228.
9. C. Pérez-Arancibia, *A planewave singularity subtraction technique for the classical Dirichlet and Neumann combined field integral equations*, Appl. Numer. Math., 123 (2018), pp. 221-240.
- 8.‡ C. Jerez-Hanckes, C. Pérez-Arancibia and C. Turc, *Multitrace/singletrace formulations and domain decomposition methods for the solution of Helmholtz transmission problems for bounded composite scatterers*, J. Comput. Phys., 350 (2017), pp. 343-360.
- 7.‡ O. P. Bruno, E. Garza-Gonzalez and C. Pérez-Arancibia, *Windowed Green Function method for nonuniform open-waveguide problems*, IEEE Trans. Antennas Propag., 65.9 (2017), pp. 4684-4692.
- 6.‡ O. P. Bruno and C. Pérez-Arancibia, *Windowed Green Function method for the Helmholtz equation in presence of multiply layered media*, Proc. R. Soc. A, 473.2202 (2017), pp. 1-20.
- 5.‡ O. P. Bruno, M. Lyon, C. Pérez-Arancibia and C. Turc, *Windowed Green Function method for layered-media scattering*, SIAM J. Appl. Math., 76.5 (2016), pp. 1871-1898.
4. C. Pérez-Arancibia and O. Bruno, *High-order integral equation methods for problems of scattering by bumps and cavities on half-planes*, J. Opt. Soc. Am. A, 31.8 (2014), pp. 1738-1746.
3. C. Pérez-Arancibia, P. Zhang, O. P. Bruno and Y. Y. Lau, *Electromagnetic power absorption due to bumps and trenches on flat surfaces*, J. Appl. Phys., 116.12 (2014), p. 124904.
2. C. Pérez-Arancibia, P. Ramaciotti, R. Hein and M. Durán, *Fast multipole boundary element method for the Laplace equation in a locally perturbed half-plane with a Robin boundary condition*, Comput. Methods Appl. Mech. Engrg., 233.1. (2012), pp. 152-163.
1. C. Pérez-Arancibia and M. Durán, *On the Green's function for the Helmholtz operator in an impedance circular cylindrical waveguide*, J. Comput. Appl. Math., 235.1 (2010), pp. 244-262.


CONFERENCE (PEER-REVIEWED) PAPERS²

- L. M. Faria, C. Pérez-Arancibia, and C. Turc. Combined field-only boundary integral equations for electromagnetic scattering. Accepted to *WAVES 2024: The 16th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, June 30–July 5, 2024, Berlin, Germany.
- T. G. Anderson, L. M. Faria, and C. Pérez-Arancibia. Solving boundary and volume integral equations with *Inti.jl*. Accepted to *WAVES 2024: The 16th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, June 30–July 5, 2024, Berlin, Germany.
- T. G. Anderson, M. Bonnet, L. M. Faria, and C. Pérez-Arancibia. Fast, provably high-order accurate methods for volume integral operators. Accepted to *WAVES 2024: The 16th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, June 30–July 5, 2024, Berlin, Germany.
- T. Strauszer-Caussade, L. M. Faria, and C. Pérez-Arancibia, Windowed Green function method for wave scattering by periodic arrays of 2D obstacles. Accepted to *WAVES 2024: The 16th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, June 30–July 5, 2024, Berlin, Germany.
- R. Arrieta, L. Faria, C. Pérez-Arancibia, and C. Turc. A high-order density-interpolation-based Nyström method for three-dimensional electromagnetic boundary integral equations. *WAVES 2022: The 15th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, July 24–29 2022, Palaiseau, France.
- J. Hu, E. Garza, C. Pérez-Arancibia and C. Sideris. High-Order accurate integral equation based mode solver for layered nanophotonic waveguides. *International Microwave Symposium*, June 6–11 2021, Atlanta, GA, USA.
- C. Pérez-Arancibia and O. P. Bruno. A high-order integral equation solver for problems of electromagnetic scattering by three-dimensional open surfaces. *WAVES 2015: The 12th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, July 20–24 2015, Karlsruhe, Germany.

THESES

- Windowed integral equation methods for problems of scattering by defects and obstacles in layered media. Ph.D. thesis, California Institute of Technology, Pasadena, CA, USA, 2016.
- Modeling and simulation of time-harmonic wave propagation in cylindrical impedance waveguides: Application to an oil well stimulation technology. Master's thesis, Escuela de Ingeniería, Pontificia Universidad Católica de Chile, Santiago, Chile, 2010.

SELECTED TALKS AND PRESENTATIONS

- The 13th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2024), Berlin, Germany, June 20–July 5, 2024.
- International Conference on Applied Mathematics (ICAM 2024), City University of Hong Kong, Hong Kong, May 28 – June 1, 2024 (invited speaker).
- Institute of Computational Mathematics and Scientific Computing Seminar, Chinese Academy of Sciences, May 7, 2024 (invited talk online).
- Seminars in Numerical Analysis, Delft University of Technology, Delft, March 16, 2024 (invited talk).
- The 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023), Tokyo, Japan, August 20–25, 2023 (invited talk).
- Workshop on Computational Methods for Multiple Scattering. Isaac Newton Institute, Cambridge, UK, April 17–21, 2023 (invited talk). [Link to video](#) .
- SIAM Conference on Computational Science and Engineering, Amsterdam, The Netherlands, March 1, 2023.
- The 12th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2022), Palaiseau, France, July 25–29, 2022.

²The speaker's name is underlined.

- IEEE GRSS-APS Joint Student Chapter, University of Southern California, Los Angeles, CA, USA, April 7, 2022 (invited talk online).
- Conference on Mathematics of Wave Phenomena, Karlsruhe, Germany, February 14–18, 2022 (invited talk online).
- Applied Mathematics Colloquium, University of Colorado at Boulder, January 21, 2022 (invited talk online).
- International Conference on Spectral and High Order Methods (ICOSAHOM 2020+1), Vienna, Austria, July 12–16, 2021.
- POEMS Seminar, ENSTA Paris, Palaiseau, France, April 15, 2021 (invited talk online).
- Numerical Analysis of Electromagnetic Problems, Oberwolfach Mathematical Research Institute, Germany, March 23, 2021 (invited talk online).
- Applied Mathematics Colloquium, New Jersey Institute of Technology, Newark, NJ, USA, January 31, 2020 (invited talk).
- Numerical Methods for Partial Differential Equations Seminar, MIT, Cambridge, MA, USA, January 29, 2020 (invited talk).
- Applied Mathematics and Scientific Computing Seminar, Temple University, Philadelphia, PA, USA, January 27, 2020 (invited talk).
- French Latin-American Conference on New Trends in Applied Mathematics, Center for Mathematical Modeling, Universidad de Chile, Santiago, Chile, November 5-8, 2019 (invited talk).
- PUC-Bath Workshop on PDE's and Applications, Santiago, Chile, September 12, 2019 (invited talk).
- Coloquio del Departamento de Ingeniería Matemática, Universidad de Concepción, Chile, May 23, 2019 (invited talk).
- SIAM Conference on Computational Science and Engineering, Spokane, Washington, WA, USA, March 1, 2019 (invited talk).
- The 6th Chilean Workshop on Numerical Analysis of Partial Differential Equations (WONAPDE 2019), Concepción, Chile, January 22, 2019.
- The 2nd Chilean Symposium on Boundary Element Methods, Universidad Federico Santa María, Valparaíso, Chile, December 14, 2018 (invited talk).
- Mathematical Sciences Colloquium, University of Massachusetts at Lowell, MA, USA, October 13, 2017 (invited talk).
- Institute for Mathematical and Computational Engineering Seminar, PUC, Santiago, Chile, August 24, 2017 (invited talk).
- Caleta Numérica, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile, August 18, 2017 (invited talk).
- The 9th Meeting on Numerical Analysis of Partial Differential Equations (Santiago Numérico III), Santiago, Chile, June-28-30, 2017.
- Numerical Methods for Partial Differential Equations Seminar, MIT, Cambridge, MA, USA, April 19, 2017 (invited talk).
- The 10th International Conference on Scientific Computing and Applications, Fields Institute, Toronto, Canada, June 6-10, 2016 (invited talk).
- The 13th Annual Conference on Frontiers in Applied and Computational Mathematics (FACM 2016), Newark, NJ, USA, June 3-4, 2016 (invited talk).
- Applied and Computational Mathematics Seminar, University of California, Irvine, CA, USA, February 22, 2016 (invited talk).
- Applied and Computational Mathematics Seminar, University of California, Merced, CA, USA, February 2, 2016 (invited talk).

- The 12th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2015), Karlsruhe, Germany, July 20-24, 2015.
- AMMCS-CAIMS Congress, Waterloo, Ontario, Canada, June 7-12, 2015 (invited talk).
- SIAM Conference on Computational Science and Engineering, Salt Lake City, Utah, USA, March 14-18, 2015 (invited talk).
- International Conference on Spectral and High Order Methods (ICOSAHOM 2014), Salt Lake City, UT, USA, June 23-27, 2014.
- NSF Workshop on the BEM, University of Minnesota, Minneapolis, MN, USA, April 23-26, 2012 (poster).
- Valparaíso's Mathematics and its Applications Days, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile, December 12-14, 2012 (invited talk).

TEACHING EXPERIENCE

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|---|-----------------------|
| <p>UNIVERSITY OF TWENTE
<i>Lecturer</i></p> <ul style="list-style-type: none"> · Analysis I, 1st term, 2022 and 2023. · Analysis II, 2nd term, 2022 and 2023. | <p>9/21 - Present</p> |
| <p>PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
<i>Lecturer</i></p> <ul style="list-style-type: none"> · Calculus III (MAT1630), 1st semester of 2020 (~240 students) and 2021 (~190 students). · Engineering Applications of PDEs and Functional Analysis (IMT3130/3773), 1st semester of 2019, 2020, and 2021. · Scientific Computing II (MAT2615), 2nd semester 2020. · Scientific Computing I (MAT2605), 2nd semester 2019. · Advanced Topics in Numerical Analysis (IMT3810), 2nd semester 2019. · Capstone Course on Mathematical and Computational Engineering (IMT3500), 2nd semester 2018. | <p>6/18 - 8/21</p> |
| <p>MASSACHUSETTS INSTITUTE OF TECHNOLOGY
<i>Lecturer</i></p> <ul style="list-style-type: none"> · Fast Methods for Partial Differential and Integral Equations (18.336J/6.335J), Fall 2016 and 2017 (link to the course's website ↗). · Linear Partial Differential Equations: Analysis and Numerics (18.303), Spring 2018. | <p>9/16 - 6/18</p> |
| <p>CALIFORNIA INSTITUTE OF TECHNOLOGY
<i>Teaching Assistant</i></p> <ul style="list-style-type: none"> · Methods of Applied Mathematics A (ACM101A), Fall 2014 and 2015. · Methods of Applied Mathematics B (ACM101B), Winter 2015 and 2016. · Introductory Methods of Applied Mathematics A (ACM100A), Fall 2012, 2013 and 2014. · Introductory Methods of Applied Mathematics B (ACM100B), Winter Term 2013. · Introductory Methods of Applied Mathematics C (ACM100C), Spring 2013, 2014 and 2015. · Introductory Methods of Computational Mathematics B (ACM106B), Winter 2014. | <p>9/12 - 6/16</p> |
| <p>PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
<i>Lecturer</i></p> <ul style="list-style-type: none"> · Mathematical Methods Applied to Engineering (IMM2650), 2nd Semester 2010. | <p>8/10 - 12/10</p> |
| <p>PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
<i>Teaching Assistant</i></p> <ul style="list-style-type: none"> · Numerical Analysis of Partial Differential Equations, 2nd semester 2009. · Introduction to Numerical Analysis of Partial Differential Equations, 1st semester 2009. · Calculus II, 2nd semester 2008. | <p>3/06 - 12/09</p> |

- Calculus III, 2nd semester 2008.
- Partial Differential Equations, 1st semester 2007 and 2008.
- Calculus I (Maple laboratory), 1st semester 2008.
- Differential Equations, 1st semester 2006 and 2nd semester 2007.
- Linear Algebra, 1st and 2nd semesters 2006.

FUNDING

- NWO OPEN COMPETITION DOMAIN SCIENCE (M1) awarded by the Dutch Research Council, the Netherlands
 Title: *Density interpolation methods for the fast and high-order evaluation of volume potentials in complex geometries*
 Role: Principal investigator
 Period: 2024 – 2028 (4 years)
 Budget: €372,565 (~ \$405,209)
- STRATEGIC RESEARCH INITIATIVE awarded by the 4TU Applied Mathematics Institute, the Netherlands
 Title: *Advancing mathematical methods for wave phenomena*
 Role: Co-principal investigator
 Period: 2024 – 2026 (2 years)
 Budget: €5,000 (~\$5,515) extendable to €25,000 (~\$27,579).
- FONDECYT DE INICIACIÓN EN INVESTIGACIÓN awarded by Agencia Nacional de Investigación y Desarrollo, Chile
 Title: *Fast and efficient method of moments for electromagnetic wave propagation and scattering in the presence of unbounded material interfaces*
 Role: Principal investigator
 Period: 2018 – 2021 (3 years)
 Budget: CLP 61,298,000 (~ \$87,500)
- MISTI GLOBAL SEED FUNDS awarded by the Massachusetts Institute Technology and the Pontificia Universidad Católica de Chile
 Title: *High-Contrast challenges in numerical wave scattering*
 Role: Co-principal investigator
 Period: 2016 – 2017 (2 years)

AWARDS

- TOP CHINA UC SANTANDER FELLOWSHIP, December 2018.
- ICES POSTDOCTORAL FELLOWSHIP, UNIVERSITY OF TEXAS AT AUSTIN, February 2016 (declined).
- IMA POSTDOCTORAL FELLOWSHIP, UNIVERSITY OF MINNESOTA, January 2016 (declined).
- PIMS POSTDOCTORAL FELLOWSHIP (CANADA), December 2015 (declined).
- AMMCS-CAIMS STUDENT TRAVEL AWARD, June 2015.
- SIAM STUDENT TRAVEL AWARD, March 2015.
- STUDENT TRAVEL AWARD, NSF Workshop on the BEM, University of Minnesota, April 2012.
- CALTECH INSTITUTE FELLOWSHIP, September 2011.
- CONICYT SCHOLARSHIP FOR MASTER'S STUDIES IN CHILE, January 2009.
- PADRE ALBERTO HURTADO AWARD, Pontificia Universidad Católica de Chile, March 2003.

SERVICE

JOURNAL PAPER REVIEW

- Journal of Computational Physics (2015, 2018, 2019, 2022)
- SIAM Journal on Applied Mathematics (2018, 2020, 2022)
- SIAM Journal on Scientific Computing (2017)

- SIAM Journal on Numerical Analysis (2018)
- Computers and Mathematics with Applications (2019)
- Advances in Computational Mathematics (2023)
- IMA Journal of Applied Mathematics (2022)
- IMA Journal of Numerical Analysis (2020)
- SN Partial Differential Equations and Applications (2020)
- IEEE Transactions on Antennas and Propagation (2021)
- Engineering Optimization (2017)
- International Journal for Numerical Methods in Engineering (2015)
- Journal of Algorithms and Optimization (2014)
- Progress in Electromagnetic Research PIERS (2011, 2012, 2014)
- International Journal on Geomathematics (2022)
- Journal of Applied Mechanics (2024)
- Nature Communications (2023)

SEMINAR AND MINISYMPOSIUM ORGANIZATION

- Kick-off meeting of the 4TU.AMI Strategic Research Initiative: WAVES NL: Advancing Mathematical Methods for Wave Phenomena. University of Twente, Sept. 20, 2024.
- Recent Advances on Integral Equation and Spectral Methods for Inhomogeneous Problems (with Thomas G. Anderson, Rice University). Minisymposium at SIAM CSE 2023, March 2023.
- Time-Evolution and Frequency-Domain Methods for Partial Differential Equations (with David Shirokoff, NJIT). Minisymposium at WONAPDE 2019, January 2019.
- Seminar of the Institute for Mathematical and Computational Engineering. Weekly research seminar for graduate and undergraduate applied mathematics students at PUC Chile. 2020 academic year.
- Numerical Methods for Partial Differential Equations Seminar (with Manuel A. Sánchez, PUC). PUC Chile, 2nd Semester 2018.

MEMBERSHIPS

- Applied Mathematics Programme Committee, University of Twente (since September 2023).
- Society of Industrial and Applied Mathematics (SIAM).
- Institute of Electrical and Electronics Engineers (IEEE).

PARTICIPATION IN PH.D. COMMITTEES

- Erli Wind-Andersen, Ph.D. in Mathematical Sciences, New Jersey Institute of Technology.
- Ruben Ailwyn. Ph.D. in Electrical Engineering, PUC Chile.

PARTICIPATION IN M.Sc COMMITTEES

- Bert Oudsten, MSc. in Applied Mathematics, University of Twente.
- Reinout Nonhebel, MSc. in Applied Physics, University of Twente.
- Genaro Laymuns, MSc. in Mathematical and Computational Engineering, PUC.
- Pedro Izquiero, MSc. in Mathematical and Computational Engineering, PUC.

RESEARCH SUPERVISION

GRADUATE STUDENTS MENTORSHIP

- Vicente Hojas: PUC Chile, master's thesis (Ph.D. student at Caltech).
- Thomas Strauszer: PUC Chile, master's thesis (Ph.D. student at University College London).
- Rodrigo Arrieta: PUC Chile, master's thesis (Ph.D. student at MIT).
- Ignacio Labarca: PUC Chile, master's thesis (Ph.D. from ETH Zürich).

UNDERGRADUATE STUDENTS MENTORSHIP

- Robert-Jan Nijhuis: University of Twente, The Netherlands. Bachelor's thesis.

- Mayank Thakur: University of Twente, The Netherlands. Bachelor's thesis.
- Gernt Hanskamp: University of Twente, The Netherlands. Bachelor's thesis.
- Jelle Boon: University of Twente, The Netherlands. Bachelor's thesis.
- Guilhem Penet: ENSTA Paris, France. Research internship.
- Vicente Gomez: PUC Chile (Ph.D. student at NYU Courant Institute).