

CURRICULUM VITAE

VICTOR AYALA BRAVO

I. Personal Data

Date of Birth 13-05-1950

Sex Male

Nationality Chilean

Cel 55 9 76092256

Mailing Address

Andrés Bello 1333, Arica

e-mail vayala@uta.cl and web page: victorayala.cl

II. Academic Background

II.1 Academic Degrees

Doutor em Ciências, Universidade Estadual de Campinas, Brazil, 1989

Magíster en Matemáticas, Universidad Técnica del Estado, Chile, 1980

Postdoctoral Position at International Centre for Theoretical Physics, ICTP, Italy, 1994

Posdoctoral Position at Unicamp, Brazil, 1989.

II. 2 Academic Appointments

Full Professor at Universidad de Tarapacá (UTA), Chile, from 2016

Full Professor at Universidad Católica Del Norte (UCN), Chile, 1991-2015

Head of the Departamento de Matemáticas (UCN), Chile, 2005-2006

Head of Research and Postgraduate Depto. de Matemáticas UCN, Chile, 1997-2000

Visiting Professor at Iowa State University, Ames, Iowa, USA, 2002

Visiting Professor at International Centre for Theoretical Physics, Trieste, Italy, 1994

Full time Professor at Universidad Austral de Chile, Chile, 1977-1990.

III. National Research Projects (not including foreign projects)

CONICYT Consejo Nacional de Ciencia y Tecnología, Chile

FONDECYT Fondo Desarrollo en Ciencia y Tecnología de Conicyt, Chile

- Fondecyt Regular as a Main Researcher: 8 projects (5 of 4 years and 3 of 3 years)
- Fondecyt International Cooperation as Main Researcher: 4 projects of 1 year
- Posdoctorate Position as a Supervisor: 2 project of 2 years
- Fondecyt Regular as a Co-Researcher: 3 projects

The following information comes from the official web page of ANID (EX CONICYT)

Víctor Ayala Bravo Fondecyt Projects

The amount of any of the first 8 project ranges between US 80,000 and US 100,000.

- 1. Fondecyt Regular (Main Researcher) n° 1190142, 2019-2023**

LINEAR SYSTEMS ON LIE GROUPS. GEOM. AND DYNAMIC RELATED TOPICS

- 2. Fondecyt Regular (Main Researcher) n° 1150292, 2015-2019**

LINEAR CONTROL SYSTEMS ON LIE GROUPS. SUBRIEMANNIAN GEOMETRY, OPTIMALITY AND SEMIGROUPS

- 3. Fondecyt Regular (Main Researcher) n° 1100375, 2010-2015**

GEOMETRIC CONTROL SYSTEMS: TOPOLOGICAL EQUIVALENCE, CONTROLLABILITY, STABILITY AND OPTIMALITY

- 4. Fondecyt Regular (Main Researcher) n° 1060981, 2006-2010**

CONTROL SETS AND SPECTRUM APPROACH TO SEMIGROUPS AND DYNAMICAL SYSTEMS. PONTRYAGIN MAXIMUM PRINCIPLE ON HOMOGENEOUS SPACES

- 5. Fondecyt Regular (Main Researcher) n° 1020439, 2002-2006**

OPTIMAL PROBLEMS OF LINEAR CONTROL SYSTEMS ON LIE GROUPS. TOTALLY POS. MATRICES AND CONTROL SETS

6. Fondecyt Regular (Main Researcher) n° 1990360, **1999-2002**

SINGULAR CONTROL SYSTEMS ON LIE GROUPS

7. Fondecyt Regular (Main Researcher) n° 1960641, **1996-1999**

APROXIMACION NILPOTENTE Y CONTROLABILIDAD DE SISTEMAS LINEALES EN GRUPOS DE LIE

8. Fondecyt Regular (Main Researcher) n° 1920185, **1991-1994**

CONTRIBUCIONES A LA TEORIA GEOMETRICA DE SISTEMAS DE CONTROL

9. Postdoctorado (Supervisor) n° 3100137, **2010-2011**

PROCESOS DE CONTROL OPTIMALES, CONTROLABILIDAD Y APLICACIONES

10. Fondecyt Incentivo a la Cooperación Internacional (Main Researcher) n° 7080232, **2008**

CONTROL SETS AND SPECTRUM APPROACH TO SEMIGROUPS AND DYNAMICAL SYSTEMS. PONTRYAGIN MAXIMUM PRINCIPLE ON HOMOGENEOUS SPACES

11. Fondecyt Incentivo a la Cooperación Internacional (Main Researcher) n° 7070327, **2007**

CONTROL SETS AND SPECTRUM APPROACH TO SEMIGROUPS AND DYNAMICAL SYSTEMS. PONTRYAGIN MAXIMUM PRINCIPLE ON HOMOGENEOUS SPACES

12. Fondecyt Incentivo a la Cooperación Internacional (Main Researcher) 7020439, **2002**

OPTIMAL PROBLEMS OF LINEAR CONTROL SYSTEMS ON LIE GROUPS. TOTALLY POS MATRICES AND CONTROL SETS.

13. Fondecyt Incentivo a la Cooperación Internacional (Main Researcher) n° 7990009, **1999**

SINGULAR CONTROL SYSTEMS ON LIE GROUPS

14. Fondecyt Regular (Co-Researcher) n° 1060977, **2006-2008**

COHOMOLOGICALLY RIGID z_p - ACTIONS ON COMPACT SOLVEMANIFOLDS. CONTROL SYSTEMS ON LIE GROUPS: FOLIATION AND COVERING SPACES

15. Fondecyt Regular (Co- Researcher) n° 1990361, **1999**

MATRIX INVERSE EIGENVALUE PROBLEMS APPLIED TO DISCRETE INVERSE PROBLEMS IN VIBRATION

16. Fondecyt Regular (Co-Researcher) n° 1941137, 1994-1996

LOCALIZACION DE AUTOVALORES DE MATRICES Y CONSTRUCCION DE OBSERVADORES

IV. Postgraduate Students Supervision

Twenty-eight Postgraduate Students Supervised: 9 Ph D, 1 Diplome Course and 18 Master

1. Universidad Católica del Norte, Antofagasta, Chile

a) Doctorado en Ciencias Mención Matemática: 5 students: 2006-2014, 1 student: 2017

b) Magister en Ciencias Mención Matemática: 13 students, 1992-2010

c) Magister en Matemática, UCN-Universidad Mayor de San Andrés: 2 students, 1996

2. Iowa State University, Ames, USA

a) Master in Sciences: 1 student, 2002

3. Yildiz Technical University, Istanbul, Turkish

a) Ph D. Programme: 2 students, 1995-1998

4. International Centre for Theoretical Physics, (ICTP) Italy

a) Diplome Course: 1 student, 1994

5. Universidade Federal do Amazonas, Manaus, Brazil

a) Doutorado em Matemática: 1 student: 2017

b) Mestrado: 1 student: 2008

Information about 9 Ph D thesis

1. Título	“Control sets of linear systems and classification of almost Riemannian structures on Lie groups”
Nombre Alumno	Guilherme Zsigmond
Año	2018
Director de Tesis	Víctor Ayala Bravo (From UTA)
Co-Director	Philippe Jouan Rouen University, France
Calificación	Con Distinción

Programa	Doctorado en Ciencias mención Matemática de la Universidad Católica del Norte, Antofagasta, Chile
2. Título	“Sistemas Bilineares em Grupos de Lie”
Nombre Alumno	Max Ferreira
Año	2017
Director de Tesis	Víctor Ayala Bravo
Calificación	Máxima
Programa	Doutorado em Matemática Universidade Federal do Amazonas, Manaus, Brazil
3. Título	“Sistemas de Control Singulares Sobre Grupos de Lie”
Nombre Alumno	Carlos Wagner Marques Do Nascimento
Año	2014
Director de Tesis	Víctor Ayala Bravo
Calificación	Con Distinción
Programa	Doctorado en Ciencias mención Matemática de la Universidad Católica del Norte, Antofagasta, Chile
4. Título	“Kriging for Random Field of Positive-Definite Matrices”
Nombre Alumno	Kjetil Halvorsen
Año	2012
Director de Tesis	Víctor Ayala Bravo
Calificación	Máxima Distinción
Programa	Doctorado en Ciencias mención Matemática de la Universidad Católica del Norte, Antofagasta, Chile
5. Título	“Controlabilidad y Estabilidad de Sistemas de Control Bilineales de Dimensión 2”
Nombre Alumno	Efraín Cruz Mullisaca
Año	2009
Directores de Tesis	Víctor Ayala Bravo Wolfgang Klieman, Iowa State University, USA
Calificación	Con Distinción
Programa	Doctorado en Ciencias mención Matemática de la Universidad Católica del Norte, Antofagasta, Chile
6. Título	“Control Sets of Linear and Affin Systems and Isochronous Sets of Invariant Control Systems”

Nombre Alumno Guillermo Vera Hurtado
Año 2009
Directores de Tesis V́ctor Ayala Bravo
 Fritz Colonius, Augsburg University, Germany
Calificaci3n Ḿxima Distinci3n
Programa Doctorado en Ciencias menci3n Matemática de la
 Universidad Cat3lica del Norte, Antofagasta, Chile

7. T́tulo “Control Optimal sobre Espacios Homogéneos y Aplicaciones”
Nombre Alumno Julio César Rodríguez
Año 2009
Director(es) de Tesis V́ctor Ayala Bravo
 Luiz San Martin, Univ. Estadual de Campinas, Brazil
Calificaci3n Ḿxima Distinci3n
Programa Doctorado en Ciencias menci3n Matemática de la
 Universidad Cat3lica del Norte, Antofagasta, Chile

8. T́tulo “Linear Control Systems on Lie Groups”
Nombre Alumno Ayse Kara
Año 1995
Director de Tesis V́ctor Ayala Bravo
Calificaci3n Ḿxima Distinci3n
Programa Ph. D. in Mathematics, Institute of Pure and Applied
 Sciences, Yildiz Technical University, Istanbul, Turkish

9. T́tulo “Control Systems on the Heisenberg Groups with Physical
Applications”
Nombre Alumno Gursel Hacibekiroglu
Año 1997
Director(es) de Tesis V́ctor Ayala Bravo
Calificaci3n Ḿxima Distinci3n
Programa Ph. D. in Mathematics, Institute of Pure and Applied
 Sciences, Yildiz Technical University, Istanbul, Turkish.

Selected Papers

*V. Ayala, *Controllability of Nilpotent Systems*. Banach Center Publications, Polish Academy of Sciences, Vol. 32, pp. 35-46, 1995.

*V. Ayala, J. Tirao, *Linear Control Systems on Lie Groups and Controllability*. American Math Society. Series: Symposia in Pure Mathematics, 1999, Vol 64, N°1, pp. 47-64.

*V. Ayala and C. Kawan, *Topological Conjugacy of Real Projective Flows*. Journal of the London Mathematical Society, (2), 90, (2014), pp. 49-66.

*V. Ayala and A. Da Silva, *On the characterization of the controllability property for linear control systems on nonnilpotent, solvable three-dimensional Lie groups*. Journal of Differential Equations, 266 (2019), pp. 8233-8257.

*V. Ayala, L. San Martin and R. Ribeiro, *Controllability on $Sl(2, C)$ with restricted controls*. SIAM Journal on Control and Optimization, Vol 52, n° 4, pp. 2548-2567, 2014.

*V. Ayala and P. Jouan, *Almost Riemannian Structures and Linear Control Systems on Lie Groups*. SIAM Journal on Control and Optimization, Vol. 54, No. 5, pp. 2919–2947, 2016.

* V. Ayala, A. Da Silva, *Central periodic points of linear systems*, Journal of Differential Equations. Vol. 272, pp.310-329, Jan 2021.

V. Publications Web of Sciences (WOS)

1. V. Ayala, A. Da Silva, *Central periodic points of linear systems*, Journal of Differential Equations. Vol. 272, pp.310-329, Jan 2021.
2. V. Ayala, A. Da Silva, P. Jouan and G. Zsigmond, *Control sets of linear systems on semi-simple Lie groups*. Journal of Differential Equations. Vol. 269, n° 1, pp. 449-466, Jun 15, 2020.
3. V. Ayala, A. Da Silva, *The control set of a linear control system on the two dimensional Lie group*, Journal of Differential Equations. Vol. 268, pp. 6683-6701, May 15, 2020.
4. V. Ayala and A. Da Silva, *On the characterization of the controllability property for linear control systems on nonnilpotent, solvable three-dimensional Lie groups*. Journal of Differential Equations. Vol. 266, pp. 8233-8257, 2019.
5. V. Ayala and A. Da Silva, *Jordan decomposition and the recurrent sets of automorphisms*. Discrete and Continuous Dynamical Systems, Published Online first, 2020, doi: [10.3934/dcds.2020330](https://doi.org/10.3934/dcds.2020330)

6. V. Ayala and A. Da Silva, *Structural properties of the bounded control set of a linear system*. Accepted to SIAM Journal on Control and Optimization, 2021.
7. V. Ayala, P. Jouan, M. Torreblanca and G. Zsigmond, *Time optimal control for linear systems on Lie groups*. Accepted to Systems and Control Letters, 2021.
8. V. Ayala, M. Torreblanca and W. Valdivia, *Towards Applications of Linear Control Systems on the Real World and Theoretical Challenges*. Accepted to Symmetry, 2021.
9. V. Ayala, H. Román-Flores, *A review on some classes of algebraic systems*. International Journal of Control, Vol 93, N° 4, pp. 747-772, April 2020.
10. V. Ayala, H. Román-Flores, M. Torreblanca Todco and Erika Zapana, *Observability and symmetries of linear control systems*, Symmetry, pp.1-19, Jun 2020.
11. V. Ayala, A. Da Silva and M. Ferreira, *Affine and bilinear systems on Lie groups*. Systems and Control Letters, 117C, pp. 23-29, 2018.
12. V. Ayala and P. Jouan, *Singular Linear Systems on Lie Groups; Equivalence*. Systems and Control Letters, 120, 99.1-8, October 2018.
13. P. Jouan, G. Zsigmond and V. Ayala, *Isometries of Almost-Riemannian Structures on Lie Group*, Differential Geometry and Applications, Vol 61, pp. 59-81, December 2018.
14. V. Ayala and M. Torreblanca Todco, *Boundedness of control sets of Linear control systems*. Open Mathematics, 2018; 1–10, 2018.
15. V. Ayala and A. Da Silva, *Controllability of Linear Control Systems on Lie Groups with Semisimple Finite Center*. SIAM Journal on Control and Optimization, Vol. 55, No. 2, pp. 1332–1343, 2017.
16. V. Ayala and A. Da Silva, *Control systems on flag manifolds and their chain control sets*. Discrete and Continuous Dynamical Systems, Volume 37, Number 5, pp. 2301-2313, May 2017.
17. V. Ayala, A. Da Silva and G. Zsigmond, *Control sets of linear systems on Lie groups*. Non Differential Equations and Applications, Issue 24: 82, pp. 1-15, (2017)
18. V. Ayala, H. Román-Flores and A. Da Silva, *The dynamic of a Lie group endomorphism*. Open Math. 2017, 15: 1477-1486.
19. V. Ayala and A. Da Silva, *A Semigroup associated to a linear control system on a Lie group*. Systems & Control Letters, Vol 98, Dec. 2016, Pages 33-36.
20. V. Ayala and P. Jouan, *Almost Riemannian Structures and Linear Control Systems on Lie Groups*. SIAM Journal on Control and Optimization, Vol. 54, No. 5, pp. 2919–2947, 2016.
21. V. Ayala and C. Kawan, *Topological Conjugacy of Real Projective Flows*. Journal of the London Mathematical Society, (2), 90, (2014), pp. 49-66.

22. V. Ayala, H. Román-Flores, M. Torreblanca, *Control Sets of Linear Control Systems on Lie Groups*, Mathematical Problems in Engineering. Volume 2019, Article ID 2963120, 12 pages, <https://10.1155/2019/2963120>.
23. V. Ayala, L. San Martín and R. Ribeiro, *Controllability on $Sl(2, C)$ with restricted controls*. SIAM J. on Control and Optimization, Vol 52, n° 4, pp. 2548-2567, 2014.
24. V. Ayala and I. Jirón, *Linear flows and Morse graphs: Topological consequences in low dimensions*. Linear Algebra and Applications, 439, 2013, 2177-2194
25. V. Ayala, H. Román-Flores and A. Da Silva. *About the continuity of reachable sets of restricted affine control systems*. Chaos, Solitons and Fractals, 94 (2017) 37-43, 2017.
26. V. Ayala and E. Kizil, *The covering semigroup of invariant control systems on Lie groups*. Kybernetika, Vol 53, (2016), Number 6, pp. 837-847.
27. V. Ayala, E. Kizil and A. Da Silva, *About the solutions of linear control systems on Lie groups*. Proyecciones, Vol 35, Issue 4, pp. 491-503, 2016.
28. V. Ayala and H. Román-Flores, *Algunos aspectos matemáticos de los sistemas de control lineales a través de un problema de optimización*, Interciencia, Septiembre 2017, Vol 42, n°9, pp. 556-562.
29. V. Ayala, F. Colonius, L. Laura, and W. Kliemann, *Controllability Properties of Bilinear Control Systems on Dimension two*. Journal of Math. Computer Sci. 16 (2016), 554-575.
30. M. Ayala and V. Ayala, *Mathematical Analysis of the Geometric Mapping in the Finite Element Method*. Journal of Mathematics and Computer Sciences, 16, 2016, 273-281.
31. V. Ayala, K. Halvorsen, E. Fierro, *On the marginal distribution of the diagonal blocks in a 2-blocked Wishart random matrix*. International Journal of Analysis. Volume (2016), Article ID 5967218, <http://dx.doi.org/10.1155/2016/5967218>.
32. V. Ayala, J. Rodríguez, I. Tribuzy and C. Wagner, *Solutions of singular control systems on Lie groups*. Journal of dynamics and control systems, Vol. 18, Number 3, Pages 323-338, 2012.
33. V. Ayala and L. San Martín, *Limit behavior of control systems from shadowing semigroup and flows*. Annals of the Mathematical Theory Network and Systems 2012.
34. V. Ayala, E. Kizil, *Null controllability on Lie groups*. Proyecciones Journal of Math Vol. 32, n°1, pp. 61-72, March 2013.
35. V. Ayala, J. Rodríguez, *Optimal trajectories for angular systems on the projective line*. Optimal Control Applications and Methods, Vol 33, March/April 2012, pp. 199-213.

36. V. Ayala, J. Tirao, *Linear Control Systems on Lie Groups and Controllability*. American Mathematical Society. Series: Symposia in Pure Mathematics, 1999, Vol 64, N°1, pp. 47-64.
37. V. Ayala, W. Kliemann and F. Vera, *Isochronous sets of invariant control systems on Lie groups*. Systems & Control Letters 60 (2011) 937–942.
38. V. Ayala, E. Kizil and I. Tribuzy, On an algorithm for finding derivations of Lie algebras. *Proyecciones Journal of Mathematics*, Vol 31, n°1, pp. 81-90, March 2012.
39. V. Ayala, *Controllability of Nilpotent Systems*. Banach Center Publications, Polish Academy of Sciences, Vol. 32, pp. 35-46, 1995.
40. V. Ayala and L. San Martín, *Controllability Properties of a Class of Control Systems on Lie Groups*. Lectures Notes in Control and Information Science, 2001.
41. V. Ayala, F. Colonius and W. Kliemann, *On Topological Equivalence of Linear Flows with Applications to Bilinear Control Systems*. Journal of Dynamical and Control Systems, Vol 13, N°3, pp 313-336, 2007.
42. V. Ayala, M. Diniz, J. Lima, I. Tribuzy and J. M. Veloso. Wave front sets singularities of homogeneous sub-Riemannian three dimensional manifolds. *Cubo Journal of Mathematics*, Vol. 1, pp. 235-257, 2008.
43. V. Ayala, F. Colonius and W. Kliemann, *Dynamical characterization of the Lyapunov form of matrices*. Linear Algebra and its Applications, 2005, Vol 402, pp. 272-290.
44. V. Ayala, F. Colonius and W. Kliemann, Towards a Classification of Bilinear Control Systems, *Mathematical Theory Networks and Systems*, Electronic Journal: 2006, Vol 1, N° 1, pp. 942-946.
45. V. Ayala, W. Kliemann and L. San Martín, *Control sets and total positivity*. Semigroup Forum, 2004, Vol 69, N° 1, pp 113-140.
46. V. Ayala and W. Kliemann, *A Decomposition Theorem for Singular Control Systems on Lie Groups*. Computers and Mathematics with Applications, 2003, Vol 45, N° 4-5, pp. 635-646.
47. V. Ayala. Controllability of Nilpotent Systems. Banach Center Publications. Vol. 32, pp. 35-46, 1995.
48. V. Ayala, G. Solis, R. Femat and W. Kliemann, *Complete Synchronizability of Chaotic Systems: A Geometric Approach*. Chaos, 2003, Vol 13, N°2, 495-501.
49. V. Ayala, E. Kizil and A. Hacibekiroglu, *Observability of General Linear Pairs*. Computers and Mathematics with Applications, 2001, Vol 39, N° 1-2, pp 35-43.
50. V. Ayala and R. Zegarra, Controllability of linear systems on group of matrices, *Cubo Journal of Mathematics*, 2001, Vol 3, N°2, 171-212.
51. V. Ayala and L. San Martín, Controllability of two-dimensional Bilinear Systems: Restricted Controls, Discrete Time, *Proyecciones Journal of Mathematics*, 1999, Vol 18, pp 207-223.

52. Ayala, V., Rojo, O. and Soto, R., *Observability of the Direct Product of Bilinear Control Systems on Lie Groups*. Computer and Mathematical with Applications, Vol. 36, N° 3, pp. 107-112, 1998.
53. V. Ayala and A. Hacibekiroglu, *Local Observability of Invariant Dynamics on Compact Lie Groups with Square Integrable Output Map Functions*. Computers and Mathematics with Applications, Vol. 34, N° 12, pp. 61-70, 1997.
54. V. Ayala, E. Kizil, A. Hacibekiroglu and R. Zegarra, *Transitivity of Linear Control Systems on Lie Groups*, 1999, Comput. and Applied Mathematics, Vol 18, N°2, 1-9.
55. V. Ayala and I. Tribuzy, *On a characterization of Riemann manifolds*. Proyecciones Journal of Mathematics, Vol 27, n°2, pp 113-144, August 2008.
56. Ayala, V. and San Martín, L., *Minimal realization under controllability*. Systems and Control Letters, 04/1991, (16) 4, 289-293.

Chapter in Books

57. V. Ayala and L. San Martín. *Controllability Properties of a Class of Control Systems on Lie Groups*, Lectures Notes in Control and Information Science, 2001.
58. V. Ayala, J. Tirao. *Linear Control Systems on Lie Groups and Controllability*, American Mathematical Society. Series: Symposia in Pure Maths, 1999, Vol 64, N°1, pp. 47-64.
59. H. Román-Flores and Víctor Ayala, *Chaos on Set-Valued Dynamics and Control Sets*, Intechopen <http://dx.doi.org/10.5772/intechopen.72232>

VI National and International Conferences and Research Stay

More than 120 Conferences, Invited Sessions, Postgraduate Courses and Research Stays at many Institutions and Universities in Chile, Bolivia, Argentina, Peru, Brazil, several Universities in USA, France, Italy, Germany, Poland, Australia, Japan and Turkish.

Conferences delivered by Víctor Ayala since 2014

1. Simposio de Teoría de Lie e Aplicacoes, Universidade Estadual de Campinas, Brasil, *Linear systems on low dimensional Lie groups*. Online, 17 Diciembre de 2020
2. Simposio de Teoría de Lie e Aplicacoes, Universidade Estadual de Campinas, Brasil, *Central periodic points of linear systems*. Online, 15 Diciembre de 2020
3. Departamento de Matemáticas, Universidad de Tarapacá, *Linear Control Systems on Lie Groups. Geometric and Dynamic Related Topics*. Arica, Chile, September 2020.
4. Universidade de Brasília, Brasil, Main Conference at VI School and Workshop on Lie Theory, *Linear Control Systems on Lie Groups Twenty years Later*, August 2019.
5. Escuela Profesional de Matemática, Universidad Nacional de San Agustín, Arequipa, Perú. *Principio del Máximo de Pontryagin y Aplicaciones*, Julio, 2018.

6. COMCA 2018, Universidad de Antofagasta. Coordinador Sesión Invitada: *Teoría de Control Geométrico*, 7 Ponencias
7. Escuela Profesional de Matemática, Universidad Nacional de San Agustín, Arequipa, Perú. *Teoría de Control sobre grupos de Matrices*, Octubre, 2017.
8. Universidade Federal do Amazonas, Manaus, Brasil, 2017. *Contributions to the control systems theory*.
9. COMCA 2017, Universidad de Tarapacá. Coordinador Sesión Invitada: *Teoría de Control Geométrico*, 10 Ponencias
10. Instituto de Alta Investigación, U. de Tarapacá, Arica, Chile, 2016. *Teoría de control, desde un punto de vista de la Geometría Diferencial*
11. Institute Henri Poincaré Paris, France, 2014. Geometry, Analysis and Dynamics on Sub-Riemannian Manifolds, IHP Trimester *Almost Riemannian Structures*
12. Rouen University, Lab. Rafael Salem, Rouen, France, 2014
Linear Control Systems on Lie Groups and Applications
13. V Latin American Conference on Geometry and Lie Theory, Brazil, November 2014
Almost Riemannian Structures and Linear Control Systems on Lie Groups
14. Universidade Federal do Amazonas, Manaus, Brazil, 2014
Sistemas de Controle e Aplicacoes
15. Comca'2014, Universidad de Atacama, Chile, 2014
Contribuciones a la Teoría Geométrica de los Sistemas de Control
16. Rencontres Mathématiques de Rouen, Lab. Rafael Salem, Rouen, France, 2015. *As a Member of the Scientific Committee: <http://lmrs.univ-rouen.fr/RMR15/>*
17. IV School and Workshop on Lie Theory, Brazil, 2015
The Locus of an Almost Riemannian Structures
18. VI Latin American Conference on Geometry and Lie Theory, In Honor of Víctor Ayala

VII International Collaboration

There exists a real international collaboration with several international institutions. These relations include joint projects, joint papers, joint supervision, visiting and research stays. Specially with,

1. Universidade Estadual de Campinas, Brazil: Prof. L. San Martin, Prof. A. Da Silva
2. U. Rouen, France: Prof. Philippe Jouan
3. Iowa State University, USA: Prof. Wolfgang Kliemann
4. Augsburg University, Germany: Prof Fritz Colonius
5. U. Federal do Amazonas, Brazil: Prof. Julio Rodriguez
6. USP de Sao Carlos, Brazil: Prof. Eyup Kizil
7. Universidad Nacional de San Agustín, Arequipa, Perú: Profa. M. Torreblanca

8. U. Córdoba, Argentina: Prof. Juan Alfredo Tirao
9. ICTP, Italy.
10. Centro de Estudios Científicos, Valdivia, Chile.

Consulting in the last 10 years

1. Título: Sistemas lineales en espacios homogéneos y aplicaciones

Año: 2020. Duración 18 meses

Objetivo: Actuar como Mentor del Proyecto de Investigación Fondecyt Perú IBA-IB-004, Universidad Nacional de San Agustín, Arequipa, Perú, 2020, a cargo de la Profesora María Torreblanca Todco.

2. Título: Proyecto: Sistemas de control sobre grupos de matrices

Año: 2017. Duración: 18 meses

Objetivo: Actuar como Mentor del Proyecto de Investigación mencionado, a cargo de la Profesora María Torreblanca Todco, del Programa Ciencia Activa del CONCYTEC en la Universidad Nacional de San Agustín. Arequipa, Perú.

2. Título: Programa de Doctorado en Matemática de la Universidad de Tarapacá

Año: 2015. Duración: 7 meses

Objetivo: Entregar una visión externa, para la creación del programa desde el punto de vista de los Criterios de Acreditación de la Comisión Nacional de Acreditación

Institución Contratante: Rectoría Universidad de Tarapacá

3. Título: Sistema de Becas del Programa CONICYT

Año: desde 2006. Duración: 12 años

Objetivo: Evaluar candidatos a becas de Magister, Doctorado y Posdoctorado

Institución Contratante: CONICYT

4. Título: Evaluación del Programa de Magister de la Universidad Católica de Valparaíso

Año: 2005. Duración: 1 mes

Objetivo: Evaluar el programa

Institución Contratante: CNA

5. Título: Evaluación del proyecto MECESUP Programas de Doctorado de la Pontificia Universidad Católica y de la Universidad de Chile

Año: 2005. Duración: 2 meses

Objetivo: Evaluar el proyecto conjunto

Institución Contratante: Programa Mecesup del Mineduc

6. Título: Unversidade UniNorte, Manaus, Brasil

Año: 2008. Duración: 6 meses

Objetivo: evaluar el desempeño de los Departamentos de Matemática de 3 Sedes de la Universidad en la región del Amazonas

Institución Contratante: Universidad Uni-Norte, Manaus, Brasil

7. Título: Creación del programa de Doctorado en Matemática de la Universidad do Amazonas, Manaus, Brasil

Año: 2008

Duración: 1 año

Objetivo: Ayudar en el diseño y creación del programa

Institución Contratante: Universidad do Amazonas y Academia de Ciencias de Brasil a través de una invitación personal de su presidente, Prof. Jacob Palis.

VIII Distinctions

1. Fellowship: Best Posgraduate Student at Universidade Estadual de Campinas, Brazil: in a row 1984, 1985, 1986 and 1987

2. Fellowship from OEA, 1974-1976

3. Fellowship from ICTP, Italy, 1994

4. Best Researcher Universidad Católica del Norte 2000.

IX Others

Editor and referee of several National and International Journals. Invited by Math Reviews as a reviewer. Member of Comité de Becas de Conicyt. Reviewer of Conicyt Projects, Reviewer of Mecesup Projects, Referee of CNA, Chile.

The roll played in the creation and sustain of the *Programa de Doctorado en Ciencias mención Matemática* de la Universidad Católica del Norte, is relevant.

Interview DMATV: https://www.youtube.com/watch?v=N8cr_KGPfoI