

CURRICULUM VITAE

Dr. Jorge Ángel Dávila Montoya

Miembro del Sistema Nacional de Investigadores: Nivel 2.

Contacto

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Trabajo Actual

Instituto Politécnico Nacional. Profesor Titular "C", tiempo completo. Sección de Estudios de Posgrado e Investigación, ESIME Ticomán.

Presentación

Jorge Dávila nació en la Ciudad de México, México, el 8 de noviembre de 1977. Fue estudiante de la Universidad Nacional Autónoma de México (UNAM) en donde obtuvo los grados de Maestro en Ingeniería y Doctorado en Ingeniería, con especialización en el área de Control Automático en abril de 2005 y noviembre de 2008 respectivamente, ambas bajo la supervisión del Dr. Leonid Fridman. La UNAM le otorgó la medalla Alfonso Caso por ser el mejor estudiante de doctorado de entre todas las ingenierías en 2010.

Realizó una estancia como Investigador Posdoctoral en el Centro de Investigación y Estudios Avanzados del IPN, bajo la supervisión del Dr. Alexander Poznyak (periodo abril 2009 – abril 2010). Actualmente está formando un grupo de investigación en Control Aeroespacial en la Sección de Posgrado e Investigación en la Escuela Superior de Ingeniería Mecánica y Eléctrica Ticomán del IPN.

Ha publicado 1 libro, 6 capítulos en diferentes libros especializados (Springer, CRC Press), 35 artículos en revistas (Automatica, IEEE Transactions on Automatic Control, Journal of the Franklin Institute, International Journal of Robust and Nonlinear Control, Control Engineering Practice, Asian Journal of Control, International Journal of Control, International Journal of Systems Science, ISA Transactions) y tiene 81 contribuciones en congresos nacionales e internacionales (CDC, ACC, NOLCOS, IFAC, AIAA GNC entre otros). Es Editor Asociado del IFAC Journal of Nonlinear Analysis: Hybrid Systems y miembro del Conference Editorial Board de IEEE-CSS. Ha participado también como editor invitado en el International Journal of Robust and Nonlinear Control y el International Journal of Systems Science.

Es miembro del Sistema Nacional de Investigadores desde enero de 2010 (SNI-Nivel 2). Sus publicaciones han sido citadas 2297 ocasiones (fuente: SCOPUS) (2966 citas, Google Scholar), posee h-index=19. Los resultados presentados en sus publicaciones en teoría de control han sido aplicados exitosamente a una amplia gama de tecnologías. Actualmente es miembro del Laboratorio de Control y Sistemas Autónomos en la Sección de Posgrado e Investigación en la Escuela Superior de Ingeniería Mecánica y Eléctrica Ticomán del IPN.

Interés

Su línea de investigación principal es el desarrollo de observadores de estado y controladores utilizando combinación de propiedades geométricas y técnicas de control robusto. Actualmente desarrolla trabajos en las siguientes áreas teóricas:

- Observación de estados en sistemas con entradas desconocidas / Detección de fallas.
- Control tolerante a fallas.
- Sistemas híbridos.
- Sistemas multi-agentes.
- Sub-espacios Invariantes.
- Modos deslizantes.

En el campo aplicado, busca desarrollar técnicas de control robusto para aeronaves, con un interés particular en el control tolerante a fallas en sistemas aeronáuticos y espaciales.

Sociedades:

AIAA (American Institute of Aeronautics and Astronautics). Senior Member.
 IEEE (Institute of Electrical and Electronics Engineers). Senior Member.

Trabajo editorial.

- Associate Editor for the IFAC Journal of Nonlinear Analysis: Hybrid System (since January 2020).
- Associate Editor of the Conference Editorial Board of IEEE Control Systems Society (since 2016).
- Guest editor of the Special Issue: "Sliding-Mode Algorithms for State Estimation and Fault Diagnosis," *International Journal of Robust and Nonlinear Control*, 2021.
- Guest editor of the Special Issue: "Variable Structure Methods for Hybrid Systems," *International Journal of Systems Science*, Volume 42, Issue 11, 2011.

Educación

- Doctorado en Ingeniería. Teoría de Control. Universidad Nacional Autónoma de México. 27 de noviembre 2008.
- Maestría en Ingeniería. Teoría de Control. Universidad Nacional Autónoma de México. 20 de abril 2005.
- Ingeniería en Computación. Universidad Nacional Autónoma de México. 20 de noviembre 2000.

Premios y distinciones

- SEGUNDO LUGAR nivel doctorado en el XXV Certamen Nacional de Tesis: Energías Renovables. Otorgado por el Instituto de Investigaciones Eléctricas. Alumno: Jován Oseas Mérida Rubio, 2015.
- Best paper Award in the IX Academic Regional Encounter ERA 2014.
- Gold – Best Paper Award in Research in the 5th IFToMM-FelbIM International Symposium on Multibody Systems and Mechatronics, MUMSE 2014.
- "Medalla Alfonso Caso - UNAM" otorgada al mérito académico (mejor estudiante graduado del programa de Doctorado en Ingeniería), Universidad Nacional Autónoma de México 2010.
- Obtención del Título de Doctor en Ingeniería con mención honorífica, Universidad Nacional Autónoma de México, 2008.

Profesor Invitado.

- Department of Automation, School of Electro-Mechanical Engineering, Xidian University, Xi'an, China, del 4 al 20 de noviembre de 2019. Desarrollo de algoritmos de observación de estados para sistemas con entradas desconocidas discretos y su uso en control por modelo predictivo. Dr. Xubin Ping.
- Laboratorio Cedric del Conservatoire National des Arts et Métiers (Cnam), París, Francia, del 21 de mayo al 23 de julio de 2018. Desarrollo de algoritmos de observación de estados en sistemas LPV conmutados afectados por entradas desconocidas, invitado por el Dr. Tarek Raïssi.
- Dipartimento di Ingegneria Elettrica ed Elettronica (Departamento de Ingeniería Eléctrica y Electrónica) de la Universidad de Cagliari, Cagliari, Italia, del 9 de Junio al 19 de Julio de 2017. Consenso en sistemas multiagente con aplicación a sistemas de distribución eléctrica Smart Grids, invitado por el Dr. Alessandro Pisano.
- Dipartimento di Ingegneria Elettrica ed Elettronica (Departamento de Ingeniería Eléctrica y Electrónica) de la Universidad de Cagliari, Cagliari, Italia, del 19 de Junio al 5 de Julio de 2016. Development of distributed algorithms for the fixed-time coordination of multi-agent systems with uncertain dynamics and their application in robotics and smart-grids, invitado por el Dr. Alessandro Pisano.
- Laboratorio IMS (integración de materiales y sistemas) de la Universidad de Bordeaux, Bordeaux, Francia, del 3 de Septiembre al 3 de Octubre de 2015. New Strategies to Fault Tolerant Control and Fault Detection Based on High-Order Sliding Modes, invitado por el Dr. Jérôme Cieslak.

- Laboratorio IMS (integración de materiales y sistemas) de la Universidad de Bordeaux, Bordeaux, Francia, del 9 de Junio al 9 de Julio de 2014. New Strategies to Fault Tolerant Control and Fault Detection Based on High-Order Sliding Modes, invitado por el Dr. Ali Zolghadri.
- Universidad de Cagliari, Cagliari, Italia, del 16 de Julio al 11 de Agosto de 2012. Desacoplamiento de entradas desconocidas usando métodos geométricos, invitado por el Dr. Alessandro Pisano.
- Laboratorio IMS (integración de materiales y sistemas) de la Universidad de Bordeaux 1, Bordeaux, Francia, del 11 de Junio al 13 de Julio de 2012. Algoritmos de detección y aislamiento de fallas utilizando modos deslizantes de orden superior, invitado por el Dr. Ali Zolghadri.
- Laboratorio IMS (integración de materiales y sistemas) de la Universidad de Bordeaux 1, Bordeaux, Francia, del 24 de Octubre al 4 de Noviembre de 2011. Algoritmos de control tolerante a fallas utilizando modos deslizantes de orden superior, invitado por el Dr. Ali Zolghadri.
- Universidad de Cagliari, Cagliari, Italia, del 22 al 27 de Agosto de 2011. Algoritmos de control tolerante a fallas utilizando un enfoque multimodelo, invitado por el Dr. Elio Usai.
- Departamento de Ingeniería de la Universidad de Leicester, Leicester, Inglaterra, del 1 al 15 de Mayo de 2011. Algoritmos de control tolerante a fallas utilizando un enfoque multimodelo, invitado por el Dr. Chris Edwards.
- Institut de Recherche en Communications et Cybernétique de Nantes "IRCCyN", Nantes, Francia, del 3 de Diciembre de 2007 al 20 de Enero de 2008. Observación de Sistemas no lineales con pérdida de grado relativo y en presencia de singularidades.
- Universidad de Cagliari, Cagliari, Italia, del 2 de Noviembre al 3 de Diciembre de 2007, bajo la supervisión de Prof. Elio Usai, Prof. Alessandro Pisano and Prof. Giorgio Bartolini. Observación de sistemas no lineales con entradas desconocidas.

Participación en comités de congresos

- Member of the Local Organizing Committee the 11th IEEE International Workshop on Variable Structure Systems, (VSS 2010).
- Member of the Technical Committee in the 9th IEEE International Conference on Electrical Engineering, Computing Science and automatic Control (CCE 2012).
- Member of the Local Organizing Committee of the 5th International Symposium on Multibody Systems and Mechatronics (MuSMe 2014).
- Member of the Technical Committee of the 1st IFAC Workshop on Control of Complex Systems (COSY 2022).

Academia

- Profesor de la materia "Instrumentación y Control" para la Maestría en Tecnología Avanzada Escuela Superior de Ingeniería Mecánica y Eléctrica, Unidad Ticomán, del Instituto Politécnico Nacional (IPN), de Julio de 2012 a la fecha.
- Profesor de la materia "Teoría de Control" para la Maestría en Ingeniería Aeronáutica en la Escuela Superior de Ingeniería Mecánica y Eléctrica, Unidad Ticomán, del Instituto Politécnico Nacional (IPN), de Julio de 2011 a la fecha.
- Profesor de la materia "Dinámica de Vuelo" para la carrera de Ingeniería Aeronáutica en la Escuela Superior de Ingeniería Mecánica y Eléctrica, Unidad Ticomán, del Instituto Politécnico Nacional (IPN), de Julio de 2010 a Junio 2012.
- Profesor de la materia "Control Automático" para la carrera de Ingeniería Mecatrónica en la Facultad de Ingeniería de la Universidad Nacional Autónoma de México (UNAM), de Febrero de 2008 a Junio de 2010.
- Profesor de la materia "Análisis de Sistemas y Señales" para el área de Ingeniería Eléctrica en la Facultad de Ingeniería de la Universidad Nacional Autónoma de México (UNAM), de enero de 2007 a diciembre de 2007.
- Seminario "High order sliding mode observation and identification for systems with unknown parameters", dictado en la École Supérieure d'Électricité (SUPELEC), Francia, enero de 2006.

Alumnos graduados**Doctorado**

- Gian Carlo Gómez Cortes (Doctorado en Control Automático, CINVESTAV, 25-septiembre-2020)
- Jazmín Zenteno Torres (Doctorado en Automatización, Universidad de Bordeaux, 3-junio-2020).
- Julio Alberto Mendoza Mendoza (Doctorado en Ciencias de la Computación, CIC IPN, 15-Marzo-2016)
- Jován Oseas Mérida Rubio (Doctorado en Ingeniería Eléctrica y Telecomunicaciones, ESIME Culhuacán IPN, 25-Febrero-2015)
- Héctor Ríos Barajas (Doctorado en Ingeniería Eléctrica: Control, Facultad de Ingeniería, UNAM, 18-Agosto-2014)

Maestría

- Pablo Hernández León (Maestría en Ciencias en Sistemas Autónomos de Navegación Aérea y Submarina, CINVESTAV, 28-febrero-2020)
- Luis Héctor Manjarrez Muñoz (Maestría en Ciencias en Sistemas Autónomos de Navegación Aérea y Submarina, CINVESTAV, 23-febrero-2018).
- Francisco Javier Jacome Gonzalez Del Corral (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN, 25-enero-2018).
- Najmeh Keshtkar (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN, 4-octubre-2016) (Mención Honorífica).
- Jesús Carlos Pimentel García (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN, 20-Mayo-2016) (Mención Honorífica).
- Jazmín Zenteno Torres (Maestría en Ciencias en Sistemas Autónomos de Navegación Aérea y Submarina, CINVESTAV, 22-Abril-2016)
- Enrique Zempoaltecatl Ramirez (Maestría en Ingeniería Aeronáutica, ESIME Ticomán, IPN, 6-Mayo-2015).
- Rafael Trujillo Torres (Maestría en Ingeniería Aeronáutica, ESIME-Ticomán IPN, 6-Marzo-2015).
- Christopher Diego Cruz Ancona (Maestría en Control, CINVESTAV-IPN, 21-noviembre-2014)
- Alejandro Castillo Castillo (Maestría en Ingeniería Aeronáutica, ESIME-Ticomán IPN, 2013)
- Héctor Ríos Barajas (Maestría en Ingeniería Eléctrica: Control, Facultad de Ingeniería UNAM, 2010)

Licenciatura

- Luis Héctor Manjarrez Muñoz (Licenciatura, Ingeniería Aeronáutica, IPN, 10-marzo-2017).
- Emmanuel Yetlanezi Muñoz Valencia (Licenciatura, Ingeniería Aeronáutica, IPN, 2015)
- Giovanni Cásares Huerta (Licenciatura, Ingeniería Aeronáutica, IPN 2013)
- Gian Carlo Gómez Cortes (Licenciatura, Ingeniería Aeronáutica, IPN 2013)
- José Mario Acasio Cortés (Licenciatura, Ingeniería Mecatrónica, IPN 2013)
- Jazmín Zenteno Torres (Licenciatura, Ingeniería Mecatrónica, IPN 2013)
- Cesar Arias Peña (Licenciatura, Ingeniería Aeronáutica, IPN 2011)
- Julio Cesar Cortes Aguilar (Licenciatura, Ingeniería Aeronáutica, IPN 2011)

Alumnos realizando tesis

- Ángel Carrasco Hernández (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN).
- Yoshua Díaz Interián (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN).
- Ricardo Osvaldo Cuadros Solís (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN).
- Merlín Octavio Maravilla Castro (Maestría en Ciencias en Ingeniería Aeronáutica y Espacial, ESIME-Ticomán IPN)

Trabajos anteriores

- Investigador Posdoctoral en el Centro de Investigación y Estudios Avanzados del IPN (CINVESTAV-IPN) del 1 de abril de 2009 al 1 de abril de 2010. Supervisor Prof. Alexander Poznyak.
- 1999-2010 Diseño de sistemas, administración de redes y prestación de asistencia técnica para la red de datos y telefonía de la Universidad Nacional Autónoma de México (brinda servicio continuo a más de 300,000 usuarios).

Publicaciones

Libros

1. Olfa Boubaker, Quanmin Zhu, Magdi Mahmoud, Jose Ragot, Hamid Reza Karimi, Jorge Dávila. *New Trends in Observer-Based Control: A Practical Guide to Process and Engineering Applications*. Volume 1. Academic Press, IET, 2019, ISBN: 978-0128170380.
2. Olfa Boubaker, Quanmin Zhu, Magdi Mahmoud, Jose Ragot, Hamid Reza Karimi, Jorge Dávila. *New Trends in Observer-Based Control: A Practical Guide to Process and Engineering Applications*. Volume 2. Academic Press, IET, 2019, ISBN: 978-0128170342.

Capítulos en Libros

1. J. Dávila, J. Cieslak and D. Henry. "Disturbance Observer-Based Fault-Tolerant Control for a Class of Additive Faults," in *New Trends in Observer-Based Control: A Practical Guide to Process and Engineering Applications*. Academic Press, IET, 2019, ISBN: 978-0128170342.
2. J. Davila, L. Fridman and A. Ferrara. "Introduction to Sliding Mode Control," in *Sliding Mode Control of Vehicle Dynamics*, Ed. Antonella Ferrara, IET, 2017, ISBN: 978-1-78561-209-1.
3. H. Ríos, J. Davila and L. Fridman. "State Estimation on Switching Systems via High-Order Sliding Modes," in *Hybrid Dynamical Systems*, ser. Lecture Notes in Control and Information Sciences, Editor: M. Djemai and M. Defoort, Springer, 2015, no. 457, pp. 151-178, ISBN-13: 978-3319107943.
4. Leonid Fridman, Arie Levant and Jorge Davila. "Robust Exact Observation and Identification via High-Order Sliding Modes," in *Control and Mechatronics (The Industrial Electronics Handbook)*, Editors: Bogdan Wilamowski, J. David Irwin. CRC Press, Taylor & Francis Inc., 2011, ISBN: 9781439802878.
5. Leonid Fridman, Arie Levant and Jorge Davila. "Observation and Identification Via High-Order Sliding Modes," in *Modern Sliding Mode Control Theory: New Perspectives and Applications*, ser. Lecture Notes in Control and Information Sciences. Giorgio Bartolini, Leonid Fridman, Alessandro Pisano, Elio Usai, Eds. Eds. London: Springer Verlag, 2008, no. 375, pp. 293-319. ISBN: 978-3-540-79015-0.
6. A. Poznyak, Y. Shtessel, L. Fridman, J. Davila and J. Escobar. "Identification of Dynamic Systems Parameters via Sliding-Mode Technique," in *Advances in Variable Structure and Sliding Mode Control*, ser. Lecture Notes in Control and Information Sciences. Christopher Edwards, Enric Fossas Colet, Leonid Fridman, Eds. London: Springer Verlag, 2006, no. 334, pp. 313-347. ISBN: 3540328009.

Artículos en revistas

1. J. Davila, M. Tranninger, L. Fridman. "Finite-Time State-Observer for a Class of Linear Time-Varying Systems with Unknown Inputs," Published online in the *IEEE Transactions on Automatic Control*, 2021, DOI: <https://doi.org/10.1109/TAC.2021.3096863>.
2. J. Dávila, L. Aguilar, J. Mérida. "Increasing the Power Generation Efficiency in Horizontal Wind Turbines by Rejecting Electromechanical Uncertainties due to the Wind," *IEEE Control Systems Letters*, 2021, DOI: 10.1109/LCSYS.2021.3060157.
3. J. Dávila, A. Pisano. "Fixed-Time Leader Following Consensus for Nonlinear Uncertain Multi-Agent Systems Under Switching Topology," *International Journal of Robust and Nonlinear Control*, Vol. 31, Issue: 9, 2021, pp. 3841 - 3858, DOI: 10.1002/rnc.5130.
4. Zenteno-Torres J, Cieslak J, Dávila J, Henry D. "Sliding Mode Control with Application to Fault-Tolerant Control: Assessment and Open Problems." *Automation*. 2021; 2(1):1-30. <https://doi.org/10.3390/automation2010001>

5. Héctor Ríos, Jorge Davila and Andrew R. Teel. "State Estimation for Linear Hybrid Systems with Periodic Jumps and Unknown Inputs," *International Journal of Robust and Nonlinear Control*, Vol. 30, 2020, pp. 5966 - 5988, DOI: 10.1002/rnc.4922.
6. Héctor Ríos, Jorge Davila and Andrew R. Teel. "Linear Hybrid Systems with Periodic Jumps: A Notion of Strong Observability and Strong Detectability," *IEEE Transactions on Automatic Control*, Vol. 65, No. 6, June 2020, pp. 2640 - 2646.
7. B. Saldivar, L.F. Ramirez, J. Zenteno Torres, J. Davila, J.C. Avila Vilchis. "Robust Stabilisation of Time-Delay Systems Via First Order and Super-Twisting Sliding Mode Controllers," *IET Control Theory & Applications*, Vol. 14, No. 1, 2020, pp. 175-186, DOI: 10.1049/iet-cta.2018.6434.
8. D. Hernandez, F. J. Bejarano, J. Davila, L. M. Fridman "On the Strong Observability in Linear Time-Varying Singular Systems," *Automatica*. Vol. 101, March, 2019, pp. 60-65.
9. J. Chang, J. Cieslak, J. Davila, J. Zhuo, A. Zolghadri, Z. Guo, "A Two-Step Approach for an Enhanced Quadrotor Attitude Estimation via IMU Data," *IEEE Transactions on Control Systems Technology*, Vol. 26, No. 3, May 2018, pp. 1140-1148.
10. J. Chang, J. Cieslak, A. Zolghadri, J. Davila, J. Zhuo, "Analysis and Design of Second-Order Sliding-Mode Algorithms for Quadrotor Roll and Pitch Estimation," *ISA Transactions*, Vol. 71, Part 2, 2017, pp. 495-512.
11. R. Galván-Guerra, L. Fridman and J. Dávila, "High-Order Sliding-Mode Observer for Linear Time Varying Systems with Unknown Inputs," *International Journal of Robust and Nonlinear Control*, Vol. 27, No. 14, 2017, pp. 2338-2356. Published online DOI: 10.1002/rnc.3698.
12. C. Aguilar-Ibañez, J. Mendoza-Mendoza, J. Davila, M.S. Suarez-Castanon and R. Garrido M, "A Robust Controller for Trajectory Tracking of a DC Motor Pendulum System," *International Journal of Control, Automation, and Systems*, Vol. 15, No. 4, 2017, pp. 1632-1640. DOI: 10.1007/s12555-015-0177-x
13. H. Ríos, D. Mincarelli, D. Efimov, W. Perruquetti and J. Davila, "Continuous and Discrete State Estimation for Switched LPV Systems using Parameter Identification," *Automatica*, Vol. 62, 2015, pp. 139-147.
14. H. Rios, J. Davila, L. Fridman and C. Edwards, "Fault Detection and Isolation for Nonlinear Systems via HOSM Multiple-Observer," *International Journal of Robust and Nonlinear Control*, Vol. 25, No. 16, 2015, pp. 2871-2893.
15. A. Ferreira de Loza, J. Cieslak, D. Henry, J. Dávila and A. Zolghadri, "Sensor fault diagnosis using a non-homogeneous high order sliding mode observer with application to a transport aircraft," *IET Control Theory & Applications Journal*, Vol. 9, No. 4, 2015, pp. 598-607.
16. C. Aguilar-Ibañez, J. Mendoza-Mendoza and J. Dávila, "Stabilization of the cart pole system: By sliding mode control," *Nonlinear Dynamics*, Vol. 78, No. 4, 2014, pp. 2769-2777.
17. H. Ríos, D. Efimov, J. Davila, T. Raissi, L. Fridman and A. Zolghadri, "Non-Minimum Phase Switched Systems: HOSM-Based Fault Detection and Fault Isolation via Volterra Integral Equation," *International Journal of Adaptive Control and Signal Processing*, Vol. 28, No. 12, 2014, pp. 1372–1397.
18. L. Nehaoua, D. Ichalal, H. Arioui, J. Davila, S. Mammar, and L. Fridman, "An Unknown Input HOSM Approach to Estimate Lean and Steering Motorcycle Dynamics," *IEEE Transactions on Vehicular Technology*, Vol. 63, No. 7, 2014, pp. 3116-3127.
19. J. Merida, L. Aguilar and J. Davila, "Analysis and synthesis of sliding mode control for large-scale variable speed wind turbine for power optimization," *Renewable Energy*, Vol. 71, 2014, pp. 715-728.
20. C. Aguilar-Ibañez, J. Mendoza-Mendoza, M.S. Suarez-Castañon and J. Davila, "A Nonlinear Robust PI Controller for an Uncertain System," *International Journal of Control*, Vol. 87, No. 5, 2014, pp. 1094-1102.
21. Jorge Davila, "Exact tracking using backstepping control design and high-order sliding modes", *IEEE Transactions on Automatic Control*, Vol. 58, No. 8, 2013, pp. 2077-2081.
22. Hector Rios, Jorge Davila, Leonid Fridman. "High-Order Sliding Modes Observers for Nonlinear Autonomous Switched Systems with Unknown Inputs," *Journal of the Franklin Institute*, Vol. 349, No. 10, 2012, pp. 2975-3002.
23. C. Aguilar-Ibañez, R. Garrido-Moctezuma, J. Davila. "Output feedback trajectory stabilization of the uncertainty DC servomechanism system," *ISA Transactions*, Vol. 51, No. 6, 2012, pp. 801-807.

24. J. Davila, H. Rios, L. Fridman, "State observation for nonlinear switched systems using nonhomogeneous high-order sliding mode observers," *Asian Journal of Control*, Vol. 14, No. 4, 2012, pp. 911-923.
25. L. Fridman, J. Davila and A. Levant. "Variable Structure Methods for Hybrid Systems," *International Journal of Systems Science*, Vol. 42, No. 11, 2011, 1843–1845.
26. Jorge Davila, Alexander Poznyak. "Dynamic sliding mode control design using attracting ellipsoid method," *Automatica*, Vol. 47, No. 7, 2011, pp. 1467-1472.
27. Jorge Davila, Alessandro Pisano, Elio Usai. "Continuous and discrete state reconstruction for nonlinear switched systems via high-order sliding-mode observers," *International Journal of Systems Science*. Vol. 42, No. 5, May, 2011, pp. 725-735.
28. Leonid Fridman, Jorge Davila, Arie Levant. "High-Order Sliding-Mode Observation for Linear Systems with Unknown Inputs," *Nonlinear Analysis: Hybrid Systems*. Vol. 5, No. 2, 2011, pp. 189-205.
29. Jorge Davila, Alexander Poznyak. "Sliding Modes Parameter Adjustment for Perturbed Linear Systems in the Presence of Actuators," *International Journal of Robust and Nonlinear Control*. Vol. 25, No. 5, March 2011, pp. 473-487.
30. Jorge Davila, Leonid Fridman, Alessandro Pisano and Elio Usai. "Finite-time state observation for non-linear uncertain systems via higher-order sliding modes," *International Journal of Control*. Vol. 82, No. 8, 2009, pp. 1564 – 1574.
31. N.K. M'Sirdi, A. Rabhi, L. Fridman, J. Davila and Y. Delanne. "Second order sliding-mode observer for estimation of vehicle dynamic parameters," *International Journal of Vehicle Design*. Vol. 48, No. 3/4, 2008, pp. 190 – 207.
32. L. Fridman, A. Levant and J. Davila. "Observation of linear systems with unknown inputs via high-order sliding-modes," *International Journal of System Science*. Vol. 38, No. 10, October 2007, pp. 773 – 791.
33. R. Merzouki, J.A. Davila, L. Fridman and J.C. Cadiou. "Backlash phenomenon observation and identification in electromechanical system," *Control Engineering Practice*. Vol.15, No. 4, 2007, pp. 447 – 457.
34. J. Davila, L. Fridman, A. Poznyak. "Observation and identification of mechanical systems via second order sliding modes," *International Journal of Control*. Vol. 79, No. 10, OCTOBER 2006, pp. 1251 – 1262.
35. J. Davila, L. Fridman, A. Levant. "Second Order Sliding Mode Observer for Mechanical Systems," *IEEE Transaction on Automatic Control*. Vol. 50, No. 11, NOVEMBER 2005, pp. 1785 – 1789.

Contribuciones en Conferencias

1. J. Davila, T. Raïssi, X. Ping, "On the Collaborative Observers Design for Switched Linear Systems with Unknown Inputs and Partially Unknown Relative Degree," in the Proceedings of the 2021 ACC, New Orleans, USA, 2021.
2. P. Hernández-León, J. Davila, S. Salazar, X. Ping, "Distance-Based Formation Maneuvering of Non-Holonomic Wheeled Mobile Robot Multi-Agent System," in the Proceedings of the IFAC 2020 World Congress, Berlin, Germany, 2020.
3. G-C. Gomez-Cortes, F. Castañós, J. Davila, "Sliding Motions on SO(3), Sliding Subgroups," in the Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France. December 11-13, 2019. pp. 6953-6958.
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5. H. Ríos, J. Dávila, "Diseño de Observadores para Sistemas Híbridos Lineales con Saltos Periódicos," in the Proceedings of the Congreso Nacional de Control Automático 2019, Puebla, México, 23-25 de octubre, 2019. pp. 237-242.
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Proyectos de Investigación

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2. 2019-2020. SIP – IPN (20195310) *Director*, “De la estimación robusta del estado y sus aplicaciones”.
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17. 2004-2007. CONACyT (43807-Y), *Participante*. “Investigación del problema de 'chattering' en sistemas de control con modos deslizantes, análisis y algoritmos para evitarlo”.