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References

1. Prof. Dr. Patricia Vargas, Director of the Robotics Laboratory, Heriot-Watt University Edinburgh, Scotland. Phone: +44 (0)131 451 4161. (p.vargasathw@gmail.com)
2. Prof. Dr. Alessandro Victorino, Université de Technologie de Compiègne, Compiègne, France. Phone: +33 (0)3 4423 4504. (Alessandro.Victorino@utc.fr)
3. Dr. Samuel Siqueira Bueno, Senior Research Scientist, Federal Research Center Renato Archer, Campinas, Brazil. Phone: +55 (19) 3746-6137. (Samuel.bueno@cti.gov.br)

1. Education

- Ph.D. in Electrical Engineering, Faculty of Electrical and Computing Engineering, University of Campinas, Campinas, Brazil, April 1997. Thesis: “Constrained Optimization of Robust Controllers using Genetic Algorithms”.
- M.Sc. in Electrical Engineering, Faculty of Electrical and Computing Engineering, University of Campinas, Campinas, Brazil, May 1993. Thesis: “Robust Pole Placement with Rejection to Stochastic Perturbations”.
- B.Sc. in Electrical Engineering, Faculty of Electrical Engineering, Federal University of Uberlândia, Uberlândia, Brazil, January 1990. Senior Project: “Control Design of Switching Power Supplies.”

2. Professional History

- Currently Head of Department (DSI) at the Faculty of Mechanical Engineering (FEM) at the State University of Campinas (UNICAMP), since 2016.
- Currently Professor at the State University of Campinas (UNICAMP), at Faculty of Mechanical Engineering in the course of Control and Automation Engineering, since 2010 (top 1 course in Brazil)¹.
- At this moment, principal investigator (PI) in 2 funded research projects: Project SAS-ROGE (2016-2017) in partnership with the Heriot-Watt University (Edinburgh, UK) and Project VERDE - *Electric Robotic Vehicle with Electronic Differential* (2014-2016).

¹ <http://www.unicamp.br/unicamp/noticias/2015/12/22/melhor-do-brasil>

- Associate Coordinator of the graduate course of Control and Automation Engineering of the Faculty of Mechanical Engineering (FEM-UNICAMP) (2011-2012).
- Post-Doctorate in the Information Technology Center Renato Archer (CTI-Campinas), Federal Research Center in Campinas, Brazil, 2004-2005.
- Researcher of the Information Technology Center Renato Archer (CTI-Campinas), a Federal Research Center in Campinas, Brazil, in the area of Autonomous Mobile Robotics (1997-2009). (<http://www.cti.gov.br>)
- Co-responsible for the **first autonomous flight of an unmanned outdoor airship of the scientific literature**, registered in year 2000 in Campinas, Brazil, through AURORA Project, when I was the responsible for the modelling and control system design tasks.
- Advisor of 2 teams of undergraduate students of the Control and Automation Engineering course (FEM-UNICAMP), one working with the design and development of remotely operated robots (Phoenix) and other working with the design of intelligent autonomous robots (GER), both participating in national and international robotics competitions (since 2012).
- Coordinator of 2 Educational Projects (funded by Faepex-UNICAMP) related to the upgrade of the undergraduate “Laboratory of Mechatronics” of the Faculty of Mechanical Engineering (FEM), during 2012-2014, when I was responsible for the acquisition of new lab kits of Altera FPGA, oscilloscopes, National Labview licenses, power electronic kits and computers/notebooks.
- Lecturer on extension courses, by Extecamp-UNICAMP, on “PID tuning: theory and practice” aimed at industry engineers that work in the process control industry (process variability reduction, process dynamics, tuning PID controllers, PID auto-tuning, valve nonlinearities, coupled and interaction loops), during 2013-2014.
- Lecturer at University São Francisco, Itatiba, SP, during 1996-2009 teaching Electronics and Control courses for Computer Engineering, Electrical Engineering and Mechanical Engineering.
- Member of ISA International Society of Automation.

3. Research Interests

- Guidance, navigation, and control of autonomous robots.
- Modelling, identification and simulation of dynamic systems.
- Robust and Nonlinear control (backstepping, sliding modes, feedback linearization, nonlinear incremental dynamics-INDI).
- Neuro-fuzzy control, visual servoing, process control and PID controllers.

4. Research projects with grants awarded by scientific agencies.

- Project SAS-ROGE - *Smart Airships Swarm and Robotic Ground Electrical Vehicles for Environmental Monitoring and Surveillance* (2016-2017). This international cooperation project between FEM-UNICAMP and Heriot-Watt University (Edinburgh, UK) focuses in the design, calibration and testing of an integrated simulator of a multi-robot-system comprised of a “smart airships” swarm and a robotic ground electrical vehicle for environmental monitoring and surveillance. Participation: PI (principal investigator).

- Project VERDE - *Electric Robotic Vehicle with Electronic Differential* (2014-2016). (under Fapesp funding, grant n. 2014/02672-9), coordinated by Prof. Dr. Ely Carneiro de Paiva, is related to the construction of a miniature vehicle (mini-BAJA) with two independent electric engines, instrumented with inertial navigation system INS/GPS, on-board computer with ROS drivers, plus laser, camera and encoders sensors on the wheels and motors. Participation: PI (principal investigator).
- Project DRONI – *Robotic Airship with Innovative Conception* (2014-2017) (under CNPq funding, grant n. 402112/2013-0). Conducted by CTI-Campinas, with Prof. Ely Paiva as collaborator. Project DRONI aims at designing and constructing an autonomous airship balloon (10 meters long) with 4 electric engines to be used in a pilot flight, as a proof of concept for environment monitoring in Mamirauá reserve in Amazon. Project DRONI is an evolution of the seminal Project AURORA - *Autonomous Unmanned Remote Monitoring Robotic Airship* (CNPq, Brazil, 1997-today), a multi-institutional project that was responsible, among others, for the first record of an autonomous airship flight in the scientific literature (De Paiva et al., 2006). Participation: collaborator.
- Project VERO – *Outdoor Robotic Vehicle* conducted by CTI-Campinas, since 2009, with Prof. Ely Paiva as collaborator. Project VERO aims at the development and the automation of an unmanned off-road electrical vehicle, with two rear independent electrical motors, for applications under extreme terrain conditions like banked and/or uneven/low adherence, like in automated agriculture. Participation: collaborator.



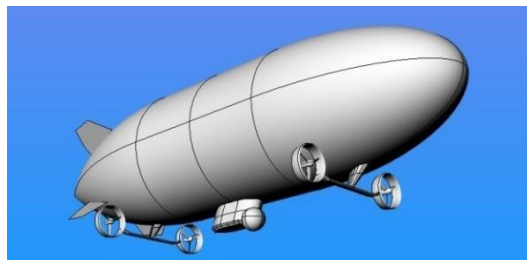
a) VERO Platform



b) AURORA Platform



c) VERDE Platform



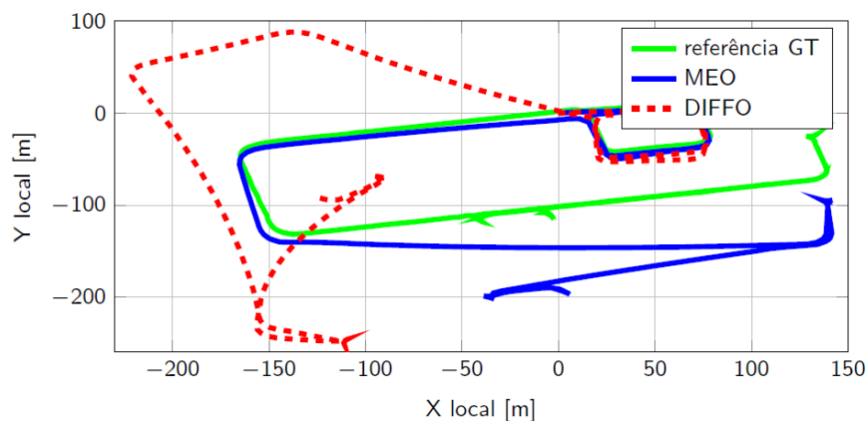
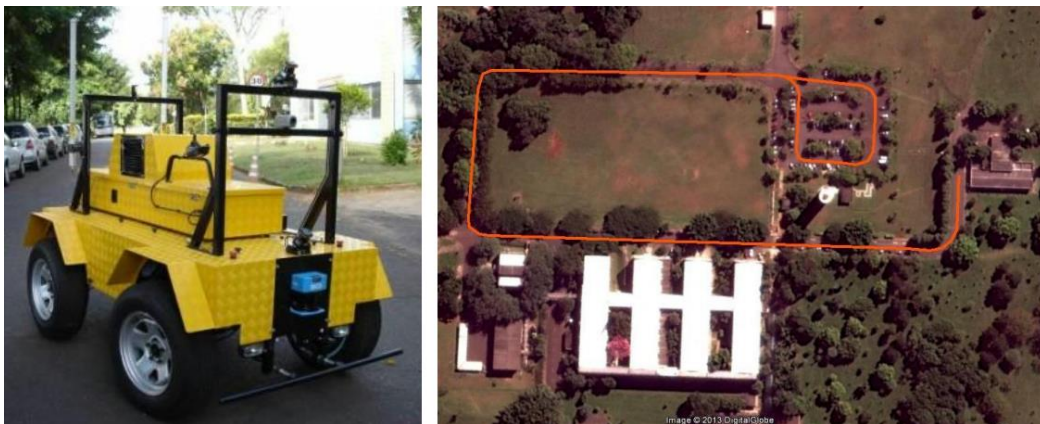
d) DRONI Platform

Platforms of the research projects of aerial and terrestrial autonomous unmanned vehicles.

- Project “AURORA - *Semi-autonomous Robotic Vehicles*” (Fapesp, 1998-2002). This project that had Prof. Ely Paiva as coordinator in his final year, was composed of a group of four young PhD researchers, who were dedicated to the research and development of two important classes of robotic vehicles, namely mobile robotic vehicles and aerial robotic vehicles.) Participation: researcher.

5. International Research Cooperation Projects

- Project SAS-ROGE - *Smart Airships Swarm and Robotic Ground Electrical Vehicles for Environmental Monitoring and Surveillance* (2016-2017). This international cooperation project between FEM-UNICAMP and Heriot-Watt University (Edinburgh, UK) focuses in the design, calibration and testing of an integrated simulator of a multi-robot-system comprised of a “smart airships” swarm and a robotic ground electrical vehicle for environmental monitoring and surveillance. Participation: PI (principal investigator).
- Project NAGUIVA – *Navigation and Guidance in Autonomous Vehicles* (2011-2013). This international cooperation project with IDMEC / IST Lisbon-Portugal was focused on modeling, simulation and development / implementation of nonlinear control strategies and navigation for an autonomous electric vehicle (VERO Project CTI). Funding agencies : CNPq / GRICES. Participation: PI (principal investigator).



Example of one of the results of NAGUIVA Project – Sensorial Fusion of 4-wheels odometry and Laser for an experimental test on VERO vehicle in the research center CTI-Campinas, in 2013.

- Project MuNAVe - *Multisensor-based Navigation and Control for Autonomous Vehicles* (CNPq-CNRS, 2010-2013). This project was the continuation of the effective collaboration between CTI-Campinas and *Projet Advanced Robotics and Autonomous System Institut National de Recherche en Informatique et en Automatique* (Arobas / INRIA) in Sophia Antipolis, France. The major theme was the control of an outdoor robotic vehicle, exploring the vision as a primary source of information, not discarding its association with information arising from other types of sensors. Participation: collaborator.
- Project SISROB - *Information System Architecture and Autonomy in Aerial Robotics* (2006-2009). This international cooperation project with IDMEC / IST Lisbon-Portugal was focused on the development and implementation in simulation of nonlinear control strategies and navigation for the AS800 airship (like backstepping and Sliding Modes). Funding agency: CNPq / GRICES. Participation: collaborator.
- Project ICONAR - *Multisensor Integration, Control and Navigation of Robotic Aircrafts* (2000-2001). The collaboration between CTI-Campinas and the ARMOR - SARA at Instituto Superior Técnico (IDMEC / IST) of Lisbon-Portugal, started in 1998 and became a reality in 2000 through ICONAR bilateral cooperation project. The areas of effective collaboration included the following subjects: modeling , simulation, control and guidance, control based on vision, instrumentation, and flight tests.
- Project VISCORA – *Vision for Control in Aerial Robotics (Vision pour la Commande en Robotique Aérienne)*. (1999-2004). The central theme of this bilateral cooperation project was the Visual Servoing methodology created by ICARE-INRIA Sophia Antipolis, France, and its use in the control of robotic systems.

6. Academic Experience

Undergraduate courses

- Robotics Modelling and Control (ES827, ES927)
- Control of dynamic systems (ES710, ES728)
- Neural and Fuzzy Control (ES727)
- Laboratory of Electronics and Mechatronics (ES563, ES572, ES664)
- Industrial Automation (ES926)

Graduate courses

- Mobile Robots Control (IM420)
- Nonlinear Control (IM420)
- PID Controllers: theory, tuning and practice (IM4200)

7. Educational/Teaching University Projects

- Robotic Team PHOENIX (2012-2015). Advisor of a team of undergraduate students of the Control and Automation Engineering courses (FEM-UNICAMP),

which works with the design and development of remotely operated aiming the participation in robotics competitions.

- Robotic Team GER (2012-today). Advisor of a team of undergraduate students of the Control and Automation Engineering courses (FEM-UNICAMP), which works with the design of intelligent autonomous robot aiming the participation in robotic competitions.
- Coordinator of 2 Educational Projects (funded by Faepex-UNICAMP) related to the enlargement and improvement of the undergraduate “Laboratory of Mechatronics” of the Faculty of Mechanical Engineering (FEM), during 2012-2014.
- Extension Course ministered: “PID Controllers for process control industry”, ministered by Prof. Ely Paiva, through Extecamp (Support and Extension Foundation of UNICAMP) (2014).

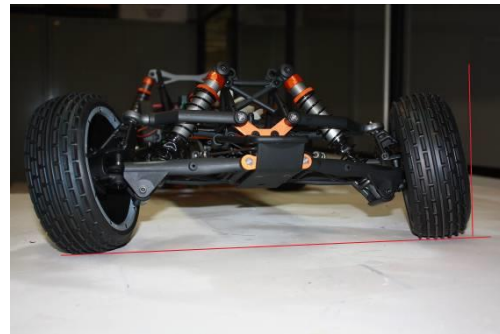
8. List of ongoing supervisions, with students holding fellowships

- Henrique Vieira. PhD candidate. “Nonlinear Control of an Unmanned Robotic Airship powered by 4-Electrical Vectoring Thrusters”. Start: 2015. FEM, State University of Campinas.
- Rafael de Angelis Cordeiro. PhD candidate. “Trajectory Control of an Off-road 4-Wheel Robotic Vehicle in Adverse Terrain Conditions”. Start: 2013. State University of Campinas (as coadvisor).



Experimental tests for the validation of the dynamic model used in the VERO simulator, a result of the Master Thesis of Rafael Cordeiro, now in the PhD program under my advisory.

- Sergio Moriguchi. Phd candidate. “Backstepping-Sliding Mode Control for the Positioning of an Autonomous Robotic Airship”. Start: 2013. State University of Campinas.
- Randerson Lemos. Master degree. “Experimental Validation of Autonomous Control Strategies for a 4-Wheel Electrical Robotic Vehicle”. Start: 2016. State University of Campinas.
- Lucas Nogueira. Master degree. “Hybrid Approach for the Estimation of Projective Homography in Robotics”. Start: 2017. State University of Campinas.
- Pedro Gatti Artaxo Netto. Master degree. “Design and Simulation of Coordinated Flight of Multiple Airships”. Start: 2017. State University of Campinas.



VERDE platform under construction, a mini-Baja vehicle powered by two independent rear motors, a scaled version of the vehicle of VERO Project.

9. List of concluded supervisions

- Rafael de Angelis Cordeiro. Master degree. “Modelling and Path Tracking Control of 4-Wheel Electrical Robotic Vehicle”. 2011-2013. Faculty of Mechanical Engineering. State University of Campinas.
- Ronald Ricardo Martinez Arias. Master degree. “Dynamic Modelling of a Robotic Airship with Quad Electric Propulsion”. 2012-2014. Faculty of Mechanical Engineering. State University of Campinas.
- Leonardo Rodrigues Miranda. Master degree. “Non-metric Intensity Based Visual Servoing Applied to a Unicycle-Type Robot”. 2013-2016. Faculty of Mechanical Engineering. State University of Campinas.

- Fábio Benjovengo. PhD degree. “Sliding Mode Control of the Longitudinal Mode of a Robotic Airship”. 2016. Faculty of Electrical and Computing Engineering. State University of Campinas. (as coadvisor).

10. Academic quantitative indicators

Books chapters: 1

Journal Publications: 12

Conference Papers: 59

Supervised and concluded Masters’ dissertations: 3

Ph.D. orientations undergoing: 3

Masters orientations undergoing: 4

Coordination of research projects: 4

Participation in international cooperation programs: 6

Number of citations received according to Google Scholar (by Aug/25/2016): 673

Link to MyCitations (Google Scholar)

<https://scholar.google.com/citations?user=6WL2QdcAAAAJ&hl=en>

11. Reviewing Activities

Reviewer of the journals:

Journal of Guidance, Control and Dynamics (JGCD-AIAA); Journal of Marine Science and Technology (JMST); Mechanical Systems and Signal Processing; Journal of the Brazilian Society of Mechanical Sciences and Engineering; Journal of Control, Automation and Electrical Systems.

Reviewer of the conferences:

ICRA 2016, Brazilian Conference on Automation (CBA), Brazilian Symposium on Intelligent Automation (SBAI).

12. Languages

English: Fluent

French: Good conversation, excellent reading and writing skills

Portuguese: Fluent

Spanish: Good reading and conversational skills

13. Other kind of intellectual production

Historian/writer:

<https://www.facebook.com/OHomemDoCavaloBranco>

14. List of publications and scientific results

Book Chapters

Elfes, A. ; Bergerman, M. ; Bueno, S. S. ; Ramos, J. J. G. ; **de PAIVA, E. C.** ; Carvalho, J. R. H. ; Maeta, S. M. ; Mirisola, L. G. ; Faria, Bruno Guedes ; Azinheira, J R. “Modelling, Control and Perception for an Autonomous Robotic Airship”. In: Bunke, H.;Christensen, H. I.; Hager, G.; and Klein, R. (Org.). *Sensor Based Intelligent Robots - Lecture Notes in Computer Science*. New York: Springer-Verlag, 2002, v. 2238, p. 216-244.

Peer-Reviewed Papers

de PAIVA, E. C. ; Azinheira, J R ; Moutinho, A.; Moriguchi, S.; Vieira, H. “Vectorial Backstepping-Sliding Mode approach for the control of an autonomous airship”. *Journal of Guidance, Control and Dynamics*, Reston, VA, USA, 2017 (submitted).

Moutinho, A. ; Azinheira, J. R. ; **de PAIVA, E. C.** ; Bueno, S. S. “Airship robust path-tracking: a tutorial on airship modelling and gain-scheduling control design”. *Control Engineering Practice*, Elsevier, v. 50, p. 22-36, 2016.

de PAIVA, E. C. ; Benjovengo, F.P.; Moriguchi, S.K.; Ferreira, P.A.V. “Sliding Mode Approaches for Longitudinal Control of an Autonomous Unmanned Airship”. *Journal of Control, Automation and Electrical Systems*, Springer, 2016 (submitted).

Azinheira, J R ; Moutinho, Alexandra ; **de PAIVA, E. C.** “A backstepping controller for path-tracking of an underactuated autonomous airship”. *International Journal of Robust and Nonlinear Control*, v. 19, p. 418-441, 2009.

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Azinheira, J R ; Moutinho, Alexandra ; **de PAIVA, E. C.**; “Airship Hover Stabilization using a Backstepping Control Approach”. *Journal of Guidance,Control and Dynamics*. AIAA, New York, v. 29, n.1, p. 903-914, 2006.

de PAIVA, E. C.; Ramos, J. J. G. ; Azinheira, J R ; Moutinho, Alexandra ; Bueno, S. S. . “Project AURORA: Infrastructure and Flight Control Experiments for a Robotic Airship”. *Journal of Field Robotics*, New York, v. 23, n.3, p. 201-222, 2006.

Elfes, A. ; Bueno, S. S. ; Ramos, J. J. G. ; Bergerman, M. ; **de PAIVA, E. C.**; Carvalho, J. R. H. ; Azinheira, J R. “Robotic Airships for Exploration of Planetary Bodies with an Atmosphere: Autonomy Challenges”. *Autonomous Robots*, Los Angeles, CA, USA, v. 14, n.2, p. 147-164, 2003.

Azinheira, J R ; **de PAIVA, E. C.**; Bueno, S. S. “Influence of Wind Speed on Airship Dynamics”. *Journal of Guidance, Control and Dynamics*, Reston, VA, USA, v. 25, n.6, p. 1116-1124, 2002.

Azinheira, J R ; Carvalho, J. R. H. ; Ramos, J. J. G. ; **de PAIVA, E. C.**; Bueno, S. S. ; Bergerman, M. ; Ferreira, P. A. V. “Lateral/Directional Control for an Autonomous Unmanned Airship”. *Aircraft Engineering*, Bradford, Inglaterra, v. 73, n.5, p. 453-458, 2001.

Azinheira, J R ; Bueno, S. S. ; **de PAIVA, E. C.**; Mirisola, L. G. ; Maeta, S. M. ; Bergerman, M. ; Elfes, A. ; Ramos, J. J. G. “Um Dirigível Não-Tripulado para Inspeção Aérea Robotizada”. *Robótica*, Lisboa, Portugal, v. 39, p. 8-10, 2000.

Conference Papers

Cordeiro, R. A., Victorino, A., Valente, P.A.V., **de Paiva, E.C.**, Bueno, S.S. (2016). “Estimation of Tire-Ground Interaction Forces Using UKF Observers in a Delayed Interconnected Cascade Structure”. *IROS State Estimation and Terrain Perception for All Terrain Mobile Robots Workshop, 2016, Korea*.

Cordeiro, R. A., Victorino, A., Valente, P.A.V., **de Paiva, E.C.**, Bueno, S.S. (2016). “Tire-Ground Forces Estimation in a 4-Wheel Vehicle Using a Delayed Interconnected Cascade-Observer Structure”. *9th IFAC Symposium on Intelligent Autonomous Vehicles (IAV 2016)*.

Cordeiro, R. A., Victorino, A., Valente, P.A.V., **de Paiva, E.C.**, Bueno, S.S. (2016). “Estimação de Forças de Interação Pneu-Solo com Estrutura de Observadores Interconectados para um Veículo Elétrico de 4 Rodas”. In: XXI Congresso Brasileiro de Automática, 2016, Vitória, Espírito Santo. Anais do XXI Congresso Brasileiro de Automática, 2016. *(to be presented, October 2016)*.

de Paiva, E. C. ; Ribeiro, A. M. ; Fioravanti, A. “Controle de Guinada de um Veículo Elétrico com Tração Traseira via Modos Deslizantes”. In: XXI Congresso Brasileiro de Automática, 2016, Vitória, Espírito Santo. Anais do XXI Congresso Brasileiro de Automática, 2016.

Silveira, G. S. ; Miranda, L. ; **de Paiva, Ely Carneiro**. “Servovisão Direta: Teoria e Experimentos”. In: *4th Brazilian Conference on Intelligent Systems (BRACIS)*, 2015, Natal, RN. XII Encontro Nacional de Inteligência Artificial e Computacional (ENIAC 2015). Natal, RN, 2015. p. 186-192.

Cordeiro, Rafael A. ; Bueno, S. S. ; Azinheira, José Raul ; **de Paiva, Ely Carneiro** ; Meirelles, P. S. ; Vivan, R. ; Azevedo H. ; Koyama, M. F. “Determinação Experimental de Parâmetros para a Modelagem Dinâmica de um Veículo Robótico Terrestre”. In: *20^o. Congresso Brasileiro de Automática*, 2014, Belo Horizonte.

Cordeiro, Rafael A. ; Azinheira, J R ; **de PAIVA, E. C.** ; Bueno, S. S. “Dynamic Modeling and Bio-Inspired LQR Approach for Off-Road Robotic Vehicle Path Tracking”. In: *IEEE16th International Conference on Advanced Robotics, ICAR 2013*, 2013, Montevideo.

Cordeiro, Rafael A. ; Azinheira, J R ; **de PAIVA, E. C.** ; Bueno, S. S. “Controle de Trajetória de um Veículo Robótico de Exterior em Terrenos Complexos, via Abordagem Bioinspirada”. In: *XI SBAI 2013 - Simpósio Brasileiro de Automação Inteligente*, 2013, Fortaleza.

Koyama, M. F. ; Azinheira, J R ; Cordeiro, Rafael A. ; Ramos, J. J. G. ; **de PAIVA, E. C.** ; Mirisola, L. G. ; Azevedo H. ; Bueno, S. S. “Controle de Velocidade em Veículos Robóticos Elétricos Acionados por Dois Motores Independentes”. In: *XI SBAI 2013 - Simpósio Brasileiro de Automação Inteligente*, 2013, Fortaleza.

Martins, J.R. ; Bueno, S. S. ; Mirisola, L. G. ; Ramos, J. J. G. ; Azevedo H. ; **de Paiva, Ely Carneiro** ; Ferreira, P. A. V. “Odometria Telemétrica com um Escâner a Laser Monocamada para Veículos em Ambientes Externos”. In: *XIX Congresso Brasileiro de Automática*, 2012, Campina Grande, Paraíba.

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Martins, J.R. ; Bueno, S. S. ; Mirisola, L. G. ; **de PAIVA, E. C.** ; Ferreira, P. A. V. . Localização em Robótica Terrestre: “Fusão entre Odometria por Múltiplos Encoders e GPS”. In: *X Simpósio Brasileiro de Automação Inteligente*, 2011, São João del Rei.

Mirisola, L. G. ; Ramos, J. J. G. ; Azevedo H. ; Bueno, S. S. ; **de PAIVA, E. C.** ; Azinheira, J R. “Validação Experimental de um Veículo Robótico Terrestre para Ambientes Externos”. In: *X Simpósio Brasileiro de Automação Inteligente*, 2011, São João del Rei.

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de PAIVA, E. C.; Azinheira, J R ; Bueno, S. S. “Controle de Trajetória para Veículos Terrestres de Exterior”. In: *XVIII Congresso Brasileiro de Automática*, 2010, Bonito, MS.

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Benjovengo, F. ; **de Paiva, Ely Carneiro** ; Bueno, S. S. “Abordagens de Controle por Modos Deslizantes para um Dirigível Autônomo”. In: *II Workshop PCI do CTI*, 2009, Campinas. II Workshop PCI do CTI, 2009.

Benjovengo, F. ; **de PAIVA, E. C.** ; Bueno, S. S. ; Ferreira, P. A. V. “Controle Longitudinal de um Dirigível Robótico por Modos Deslizantes”. In: *IX Simpósio Brasileiro de Automação Inteligente*, 2009, Brasília, DF.

Bueno, S. S. ; **de PAIVA, E. C.** ; Ramos, J. J. G. ; Azevedo H. ; Mirisola, L. G. ; Azinheira, J R; Victorino A. “Uma Plataforma para Pesquisa e Desenvolvimento em Robótica Terrestre de Exterior”. In: *Simpósio Brasileiro de Automação Inteligente, 2009*, Brasília, DF.

de Paiva, Ely Carneiro; Bueno, S. S. “Controle e Navegação de um Dirigível Robótico Autônomo”. In: *I Seminário PCI do CenPRA 2008*, Campinas.

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de PAIVA, E. C.; Benjovengo, F. ; Bueno, S. S. “Sliding Mode Control for the Path Following of an Unmanned Airship”. In: *6th IFAC Symposium on Intelligent Autonomous Vehicles - IAV 2007*, Toulouse, França.

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HOLANDA ; **de Paiva, Ely Carneiro** ; Ramos, J. J. G. “Desenvolvimento de um Kit de Robótica Pedagógica de Baixo Custo: Aspectos de Software”. In: *IX Jornada de Iniciação Científica do CenPRA. JICC 2007 PIBIC/CNPq/CenPRA*, 2007.

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de PAIVA, E. C.; CORTÉS, Victoria ; Azinheira, J R. “Parameter Identification of Nonlinear Dynamic Model of AURORA”. In: *7th. IFAC Symposium on Robot Control SYROCO'03, 2003*, Nice, França.

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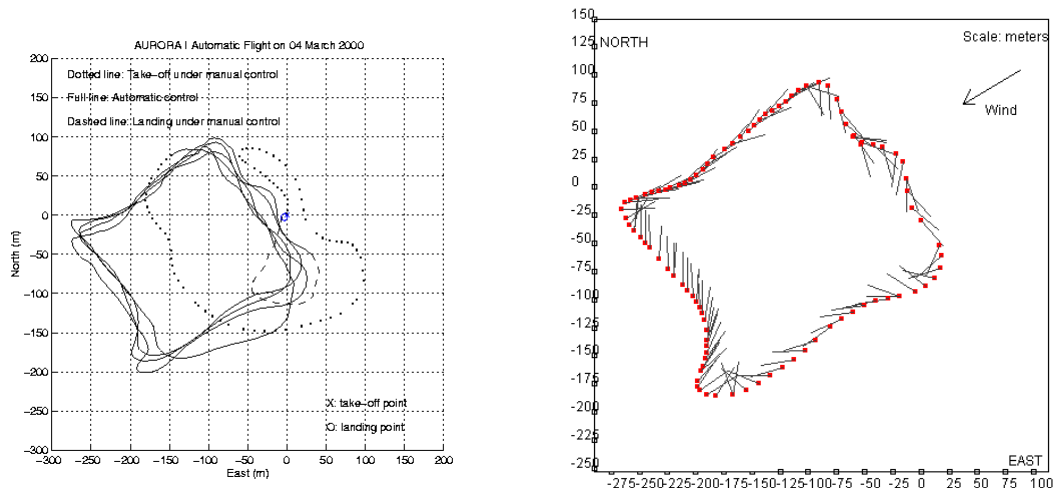
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