Curriculum Vitae

Patrícia N. Pena
Ph.D., M.A.Sc., Bach.
Electrical Engineering

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Work Contact

Department of Electronics Engineering
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Citizenship

Brazilian

ACADEMIC APPOINTMENTS

2016-present	Associate Professor Department of Electronics Engineering Universidade Federal de Minas Gerais, Brazil
2008-2016	Assistant Professor Department of Electronics Engineering Universidade Federal de Minas Gerais, Brazil
2012-present	Head of the Laboratory on Analysis and Control of Discrete Event Systems https://lacsed.eng.ufmg.br/ Department of Electronics Engineering Universidade Federal de Minas Gerais, Brazil

EDUCATION

Ph.D. (2007)	Electrical Engineering Universidade Federal de Santa Catarina, Brazil Supervisor: Prof. José E.R Cury
2005-2006 (PhD)	Visiting Scholar at the University of Michigan, Ann Arbor Supervisor: Prof. Stéphane Lafortune
M.A.Sc. (2002)	Electrical Engineering Universidade Federal de Minas Gerais, Brazil Supervisor: Prof. Fábio G. Jota
B.Sc. (2001)	Electrical Engineering Universidade Federal de Minas Gerais, Brazil

RESEARCH RECOGNITION

Speaker at the Virtual Talk Series, IEEE CSS TC on Discrete Event Systems

- Title: Applications of Untimed SCT to Scheduling Problems
- May 19, 2022

SERVICE TO THE PROFESSION

- Member, Inaugural IFAC Executive Committee on Diversity and Inclusion of the IFAC (2020-present)
- Chair, Selection Committee, International Federation on Automatic Control Foundation Diversity and Inclusion Award (IFAC Foundation), 2022
- Member, Board of Sociedade Brasileira de Automática (2021-present), the Brazilian IFAC NMO.
- Member, IEEE Technology Conferences Editorial Board (TCEB) (2022-present)
- Associate editor, Conference of Control Technology Applications, 2022
- Member, Conference Technical Program Committee, *International Workshop on Discrete Event Systems*, 2022, 2020, 2018, 2016
- Session Chair, *International Workshop on Discrete-Event Systems (WODES)*, 2020
- Participation as one of the local organizers of the XX Congresso Brasileiro de Automática, CBA'14, Belo Horizonte, Brazil.
- Participation as one of the local organizers of the *8th International Workshop on Discrete Event Systems*, WODES'06, Ann Arbor, MI, USA
- Referee in journals and conferences including the following journals:
  - *IEEE Transactions on Automatic Control*
  - *IEEE Transactions on Control Systems Technology*
  - *IEEE Transactions on Automation Science and Engineering*
  - *Automatica*

- *Journal of Discrete-Event Dynamic Systems*
- *Asian Journal of Control*
- *Journal of Manufacturing Systems*
- *Journal of Control Automation and Electrical Systems*

SUPERVISION OF HIGHLY QUALIFIED PERSONNEL

Graduate Students

Name (Dept.)	Thesis Title	Dates	Degree
Gabriel Miranda Freitas		*2022-present*	*M.A.Sc.*
Daniel Sarsur Câmara co-supervised by L.V.R. Alves		*2022-present*	*Ph.D*
Diêgo Resende		*2021-present*	*M.A.Sc.*
Michel Rodrigo das Chagas Alves co-supervised by Karen Rudie (Queen's University, Canada)	*Control of Discrete-event Systems Subject to Cyber Attacks*	*2018-2022*	*Ph.D*
Jaime Arturo Dulce Galindo co-supervised by G.V. Raffo, UFMG	*Fault-Tolerant Supervisory Control of Autonomous Vehicles Using the Concept of Opacity.*	*2017-2022*	*Ph.D*
Lucas Vinícius Ribeiro Alves	*Aplicação de Autômatos Sincronizáveis na Segurança de Sistemas a Eventos Discretos (Application of Synchronizing Automata in the Security of Systems to Discrete Events)*	*2017-2020*	*Ph.D*
Daniel Sarsur Câmara co-supervised by R.C.H. Takahashi, UFMG	*Tradução Automática de Problemas de Escalonamento Job Shop Flexível com Bloqueio para Autômatos Utilizando a Teoria do Controle Supervisório (Automatic Translation of Blocking Flexible Job Shop Scheduling Problems to Automata Using Supervisory Control Theory)*	*2018-2020*	*M.A.Sc.*
Franklin Meer Garcia Acevedo	*Abstração do Supervisor para Sistemas com Retrabalho Visando a Solução de um Problema de*	*2017-2019*	*M.A.Sc.*

	Planejamento (Supervisor Abstraction for Systems with Rework Aiming at Solving a Planning Problem)		
Márcio Júnior Nunes	*Estudo do Desempenho do Cluster Tool - Abordagem Baseada na Teoria de Controle Supervisório (Estudo do Desempenho do Cluster Tool - Abordagem Baseada na Teoria de Controle Supervisório)*	*2016-2018*	*M.A.Sc.*
Gustavo Caetano Rafael co-supervised by R.C.H. Takahashi, UFMG	*Solution of a Scheduling Problem Using an Abstraction of the Closed Loop Behaviour of a Discrete Event System (Solution of a Scheduling Problem Using an Abstraction of the Closed Loop Behavior of a Discrete Event System)*	*2016-2018*	*M.A.Sc.*
Michel Rodrigo Chagas Alves	*Abstrações de Supervisores Localmente Modulares para Aplicação na Solução de Problemas de Planejamento (Abstractions of Locally Modular Supervisors for the Solution of Planning Problems*	*2016-2018*	*M.A.Sc.*
Juliana Nogueira Vilela	*Abstração do Supervisor para a Aplicação na Solução de Problemas de Planejamento (Supervisor Abstraction for the Solution of Planning Problems)*	*2014-2016*	*M.A.Sc.*
Lucas Vinícius Ribeiro Alves co-supervised by R.C.H. Takahashi, UFMG	*Planejamento da Produção em Sistemas a Eventos Discretos: Análise Lógica e Temporal (Production Planning in Discrete Event Systems: Logical and Temporal Analysis)*	*2014-2016*	*M.A.Sc.*
Tatiana Alves Costa co-supervised by R. Takahashi, UFMG	*Métodos Metaheurísticos associados à Teoria de Controle Supervisório aplicados à Resolução do Problema de Sequenciamento de Tarefas em Sistemas Flexíveis de Manufatura (Metaheuristic Methods associated with Supervisory Control Theory to solve the Task Sequencing Problem in Flexible*	*2011-2015*	*M.A.Sc.*

	Manufacturing Systems)		
Jonatham Silva Rezende co-supervised by C.A.Maia, UFMG	*Estudo e Implementação de Técnicas de Controle de Sistemas a Eventos Discretos em CLP: Aplicação em um Sistema Flexível de Manufatura Didático (Study and Implementation of Discrete Event System Control Techniques in PLC: Application in a Didactic Flexible Manufacturing System)*	*2009-2012*	*M.Eng.*
Regiane de Sousa e Silva co-supervised by R.C.H. Takahashi, UFMG	*Uso de Algoritmo Imunológico no Controle de Sistemas a Eventos Discretos (Use of Immunological Algorithm in the Control of Systems to Discrete Events)*	*2009-2011*	*M.A.Sc.*
Hugo Jerzy Bravo Cipriano at Instituto Militar de Engenharia (IME) co-supervised by A.E Carrilho da Cunha, IME	*Verificação, Busca e Aplicação da Propriedade do Observador no Controle Supervisorio de Sistemas a Eventos Discretos (Verification, Search and Application of the Observer's Property in the Supervisory Control of Discrete Event Systems)*	*2008-2011*	*M.A.Sc.*

Undergraduate Final Projects – 1 year project

Name	Project Title	Dates
Elder Júnior Teves dos Santos (Aerospace Engineering), co-supervised by Maria Cecília Pereira (UFMG)	*Controle do Subsistema de Suprimento de Energia do PdQSat Utilizando um Modelo de Sistemas a Eventos Discretos (PdQSat Power Supply Subsystem Control Using a Discrete Event Systems Model)*	*2022*
Guilherme Gazoni Papa (Control and Automation Engineering)	*Desenvolvimento de um Twin Digital para um Protótipo de um Sistema Flexível de Manufatura (Development of a Digital Twin for a Prototype of a Flexible Manufacturing System)*	*2022*
Lucas Marques Capellini (Control and Automation Engineering)	*Identificação de DNAs satélite em uma sequência de DNA por meio de autômatos (Identification of satellite DNAs in a DNA sequence by means of automata)*	*2022*

Karen Ribeiro Oliveira (Aerospace Engineering), co-supervised by Maria Cecília Pereira (UFMG)	*Controle do Subsistema de Suprimento de Energia de um Cubesat em Órbita Baixa utilizando Sistemas a Eventos Discretos (Control of the Energy Supply Subsystem of a Cubesat in Low Orbit using Discrete Event Systems)*	*2021*
João Kleber Barbosa Rodrigues (Control and Automation Engineering)	*Implementação em CLP de um Sistema Flexível de Manufatura sob o enfoque da Teoria de Controle Supervisório de Sistemas a Eventos Discretos (Implementation in PLC of a Flexible Manufacturing System under the approach of the Supervisory Control Theory of Discrete Event Systems)*	*2019*
Guilherme Henrique Ferreira Sales (Control and Automation Engineering)	*Análise das Linhas de Produção de Peças da Carroceria de um Automóvel atráves da Teoria de Controle Supervisório (Analysis of Automobile Body Parts Production Lines through Supervisory Control Theory)*	*2019*
Jéssica Coelho Torres (Control and Automation Engineering)	*Análise de ferramentas para o desenvolvimento de uma simulação para o Sistema Flexível de Manufatura (Analysis of tools for the development of a simulation for the Flexible Manufacturing System)*	*2018*
Adriano de Araújo Abreu Mourão (Control and Automation Engineering)	*Desenvolvimento da Biblioteca clDES: Algoritmos Paralelos para Sistemas a Eventos Discretos em Plataformas Heterogêneas (Development of the clDES Library: Parallel Algorithms for Discrete Event Systems on Heterogeneous Platforms)*	*2018*
Filipe Augusto Azevedo Caixeta (Control and Automation Engineering)	*Desenvolvimento de uma Planta Didática para Ensino de Controle de Sistemas a Eventos Discretos (Development of a Didactic Plant for Teaching Control of to Discrete Event Systems)*	*2018*
Carolina Reggiani Câmara (Control and Automation Engineering)	*Aplicação do Algoritmo de Seleção Clonal a um Problema de Sequenciamento e Planejamento de Rotas Usando Controle Supervisório (Application of the Clonal Selection Algorithm to a Sequencing and Route Planning Problem Using Supervisory Control)*	*2016*

Nelson Filipe Araujo Dias (Control and Automation Engineering)	*Desenvolvimento de uma Ferramenta para Geração de Gráficos de Autômatos Utilizando a Plataforma .NET (Development of a Tool for Generating Automata Graphs Using the .NET Platform)*	*2016*
Lucas Rangel Rodrigues Martins (Control and Automation Engineering)	*Aprimoramento das estruturas de dados do UltraDES - uma biblioteca para modelagem, análise e controle de sistemas a eventos discretos. (Enhancing UltraDES data structures - a library for modeling, analyzing and controlling discrete event systems)*	*2016*
Rogger Lacerda Gontijo (Control and Automation Engineering)	*Aplicação da Ferramenta de Verificação Formal UPPAAL na Obtenção de Planos de Produção para Sistemas de Manufatura Modelados como Sistemas a Eventos Discretos (Application of the UPPAAL Formal Verification Tool in Obtaining Production Plans for Manufacturing Systems Modeled as Discrete Event Systems)*	*2015*
Tássio Abreu de Souza (Control and Automation Engineering)	*Análise do Processo de Roteamento de Minério Baseada Teoria de Controle Supervisório (Analysis of the Ore Routing Process Based on Supervisory Control Theory)*	*2015*
Ana Christine de Oliveira (Control and Automation Engineering)	*Sequenciamento de movimentos utilizando Sistema a Eventos Discretos para uma tarefa com interface homem-máquina (Motion sequencing using Discrete Event System for a task with human-machine interface)*	*2014*
Dennis Carvalho Couto. (Control and Automation Engineering)	*Implementação da Arquitetura de Controle Supervisório para a abordagem CSO usando autômatos estendidos (Implementation of the Supervisory Control Architecture for the CSO approach using extended automata)*	*2014*
Lucas Vinícius Ribeiro Alves (Control and Automation Engineering)	*Desenvolvimento de uma Biblioteca para Sistemas a Eventos Discretos para a Plataforma .Net (Development of a Library for Discrete Event Systems for the .Net Platform)*	*2014*
Pedro Paulo Bergamini Braga (Control and Automation Engineering)	*Contribuições para um Protótipo de um Sistema Flexível de Manufatura: Adaptação da Arquitetura Utilizando o Arduíno (Contributions to a Prototype of a Flexible Manufacturing System: Architecture*	*2014*

	Adaptation Using the Arduino)	
Daniel Eugênio Moreira da Costa (Control and Automation Engineering)	*Integração da Otimização com o Controle Supervisório em um Protótipo de um Sistema Flexível de Manufatura* *(Integration of Optimization with Supervisory Control in a Prototype of a Flexible Manufacturing System)*	*2013*
Bruno Costa de Almeida Pinho (Control and Automation Engineering)	*Projeto e Implementação de Controladores PID para Módulos Didáticos de Ensino de Controle* *(Design and Implementation of PID Controllers for Didactic Modules)*	*2013*
Mainda Silva Araújo (Control and Automation Engineering)	*Proposta de Racionalização dos Alarmes em uma Usina Termoelétrica* *(Proposal for Rationalization of Alarms in a Thermoelectric Power Plant)*	*2012*
Ricardo M. C. Rocha (Control and Automation Engineering)	*Modelagem e Simulação de Sistemas de Tráfego Urbano* *(Modeling and Simulation of Urban Traffic Systems)*	*2009*

PUBLICATIONS (STUDENTS, TRAINEES AND POST-DOCTORAL FELLOWS IN BOLD)

Peer-Reviewed Journal Articles

1. ALVES, LUCAS V. R. ; PENA, PATRICIA N. . Secure Recovery Procedure for Manufacturing Systems Using Synchronizing Automata and Supervisory Control Theory. Ieee Transactions On Automation Science And Engineering, v. 19, p. 486-496, 2022.

2. ALVES, MICHEL R. C. ; Pena, Patrícia N. ; RUDIE, KAREN . Discrete-event systems subject to unknown sensor attacks. Discrete Event Dynamic Systems-Theory And Applications, v. 32, p. 143-158, 2022.

3. DULCE-GALINDO, J. A. ; SANTOS, M. A. ; RAFFO, G. V. ; PENA, P.N. . Distributed supervisory control for multiple robot autonomous navigation performing single-robot tasks. MECHATRONICS, v. 86, p. 102848, 2022.

4. PENA, PATRICIA N.; VILELA, JULIANA N. ; ALVES, MICHEL R. C. ; RAFAEL, GUSTAVO C. . Abstraction of the Supervisory Control Solution to Deal With Planning Problems in Manufacturing Systems. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, v. 67, p. 344-350, 2022.

5. ALVES, L. V. R. ; PENA, P.N. ; TAKAHASHI, R. H. C. . Planning on Discrete Event Systems using parallelism maximization. CONTROL ENGINEERING PRACTICE, v. 112,

p. 104813, 2021.

6. COSTA, TATIANA A. ; Pena, Patrícia N. ; TAKAHASHI, RICARDO H. C. . SCO-Concat: a Solution to a Planning Problem in Flexible Manufacturing Systems using Supervisory Control Theory and Optimization Techniques. JOURNAL OF CONTROL, AUTOMATION AND ELECTRICAL SYSTEMS, v. 6, p. 1-12, 2018.

7. PENA, P. N.; COSTA, T.A. ; SILVA, R. S. ; TAKAHASHI, R. H. C. . Control of Flexible Manufacturing Systems under model uncertainty using Supervisory Control Theory and evolutionary computation schedule synthesis. INFORMATION SCIENCES, v. 429, p. 491-502, 2016.

8. PENA, P. N.; BRAVO, H. J. ; DA CUNHA, A. E. C. ; MALIK, R. ; LAFORTUNE, S. ; CURY, J. E. R. . Verification of the Observer Property in Discrete Event Systems. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, v. 59, p. 1-1, 2014.

9. PENA, P. N.; CUNHA, A.E.C da ; CURY, J. E. R. ; LAFORTUNE, S. . Metodologia e Ferramenta de Apoio ao Teste de Não-Conflito no Controle Modular de Sistemas a Eventos Discretos. CONTROLE & AUTOMAÇÃO (IMPRESSO), v. 21, p. 58-68, 2010.

10. PENA, P.N.; CURY, J. ; LAFORTUNE, S. . Verification of Nonconflict of Supervisors Using Abstractions. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, v. 54, p. 2803-2815, 2009.

Peer-Reviewed International Conference Papers

1. ALVES, M. R. C. ; RUDIE, K. ; PENA, P.N. . A Security Testbed for Networked DES Control Systems. In: International Workshop on Discrete Event Systems, 2022, Praga, República Tcheca. Proceedings of the International Workshop on Discrete Event Systems, 2022.

2. ALVES, L. V. R. ; PENA, P.N. . On the Reduction and Localization of Synchronizing Supervisors. In: American Control Conference, 2021, New Orleans. Proceedings of the American Control Conference, 2021.

3. DULCE-GALINDO, J. A. ; ALVES, L. V. R. ; RAFFO, G. V. ; PENA, P.N. . Enforcing State-Based Opacity using Synchronizing Automata. In: 60th Conference on Decision and Control, 2021, Austin. Proceedings of the 60th Conference on Decision and Control, 2021. p. 7002-7007.

4. ALVES, L. V. R. ; PENA, P.N. . Reconfiguration of Discrete Event Systems using Synchronizing Words. In: 15th IFAC Workshop on Discrete Event Systems, 2020, Rio de Janeiro. Proceedings of the 15th IFAC Workshop on Discrete Event Systems, 2020. p. 453-458.

5. SARSUR C., D. ; PENA, P.N. ; TAKAHASHI, R. H. C. . Automatic Translation of Blocking Flexible Job Shop Scheduling Problems to Automata Using the Supervisory Control Theory. In: 15th IFAC Workshop on Discrete Event Systems, 2020, Rio de Janeiro.

Proceedings of the 15th IFAC Workshop on Discrete Event Systems, 2020. p. 89-94.

6. ALVES, L. V. R. ; PENA, P.N. . Synchronism Recovery of Discrete Event Systems. In: 21st IFAC World Congress, 2020, Berlin. Proceedings of the 21st IFAC World Congress, 2020. p. 10609-10614..

7. DULCE-GALINDO, J. A. ; SANTOS, MARCELO A. ; RAFFO, GUILHERME V. ; PENA, PATRICIA N. . Autonomous Navigation of Multiple Robots using Supervisory Control Theory. In: 2019 18th European Control Conference (ECC), 2019, Naples. 2019 18th European Control Conference (ECC), 2019. p. 3198-3203.

8. BRAVO, H. J. ; PENA, P.N. ; ALVES, L. V. R. ; TAKAHASHI, R. H. C. . Factorization-Based Approach for Computing a Minimum Makespan Controllable Sublanguage. In: 14th International Workshop on Discrete Event Systems, 2018, Sorrento Coast, Itália. Preprints of the 14th Workshop on Discrete Event Systems, 2018. v. x. p. 30-35.

9. MALIK, R. ; PENA, P.N. . Optimal Task Scheduling in a Flexible Manufacturing System using Model Checking. In: 14th International Workshop on Discrete Event Systems, 2018, Sorrento Coast, Itália. Preprints of the 14th International Workshop on Discrete Event Systems, 2018. v. x. p. 241-246.

10. BRAVO, H.J. ; PENA, P. N. ; CUNHA, A.E.C da ; MALIK, R. ; CURY, J. E. R. . Generalised Search for the Observer Property in Discrete Event Systems. In: 12th International Workshop on Discrete Event Systems (WODES'14), 2014, Cachan. Proocedings of the 12th International Workshop on Discrete Event Systems, 2014. p. 350-355.

11. OLIVEIRA, ANA C. ; COSTA, TATIANA A. ; PENA, PATRICIA N. ; TAKAHASHI, RICARDO H. C. . Clonal selection algorithms for task scheduling in a flexible manufacturing cell with supervisory control. In: 2013 IEEE Congress on Evolutionary Computation (CEC), 2013, Cancun. 2013 IEEE Congress on Evolutionary Computation. p. 982-988.

12. BRAVO, H.J. ; CUNHA, A.E.C da ; PENA, P. N. ; CURY, J. E. R. . Generalized Verification of the Observer Property in Discrete Event Systems. In: 11th International Workshop on Discrete Event Systems, WODES'12, 2012, Guadalajara. Proceedings of the 11th International Workshop on Discrete Event Systems, WODES'12, 2012. p. 337-342.

13. HILL, R. ; PENA, P. N. . International Collaboration in an Undergraduate Control Systems Course. In: 2010 American Society for Engineering Education Annual Conference, 2010, Louisville, Kentucky, USA. Proceedings of the 2010 ASEE Annual Conference, 2010.

14. PENA, P. N.; CURY, J. E. R. ; MALIK, R. ; Lafortune, Stéphane . Efficient Computation of Observer Projections using OP-Verifiers. In: 10th International Workshop on Discrete Event Systems, 2010, Berlim. Proceedings of the 10th International Workshop on Discrete Event Systems, 2010. p. 416-421.

15. PENA, P. N.; LAFORTUNE, S. ; CURY, J. E. R. . Polynomial-Time Verification of the Observer Property in Abstractions. In: 2008 American Control Conference, 2008, Seattle. Proceedings of the 2008 American Control Conference, 2008. p. 465-470.

16. PENA, P. N.; CUNHA, A.E.C da ; LAFORTUNE, S. ; CURY, J. E. R. . New Results on the Nonconflict Test of Modular Supervisors. In: 9th International Workshop on Discrete Event Systems, 2008, Gothenburg. Proceedings of the 9th International Workshop on Discrete Event Systems, 2008. p. 468-473.

17. MALIK, R. ; FLORDAL, H. ; PENA, P. N. . Conflicts and Observers. In: 1st IFAC Workshop on Dependable Control of Discrete Systems (DCDS'07), 2007, Cachan-Paris, França. Proceedings of the 1st IFAC Workshop on Dependable Control of Discrete Systems, 2007. p. 63-68.

18. PENA, P. N.; CURY, J. E. R. ; LAFORTUNE, S. . Testing Modularity of Local Supervisors: An Approach Based on Abstractions. In: 8th Workshop on Discrete Event Systems, 2006, Ann Arbor. Proceeding of the 8th Workshop on Discrete Event Systems, 2006. v. 1. p. 107-112.

19. PENA, P. N.; CURY, J. E. R. ; LAFORTUNE, S. . New Results on Testing Modularity of Local Supervisors using Abstractions. In: 11th IEEE International Conference on Emerging Technologies and Factory Automation, 2006, Praga. Proceedings of the 11th IEEE International Conference on Emerging Technologies and Factory Automation, 2006. p. 950-956.

OTHER SCHOLARLY WORK

Software Tool

- Supervise large-scale software development, *UltraDES* for modeling, analysis and control of discrete-event systems, since 2015.
- UltraDES is an open-source library to the modeling, analysis and control of DES, written using C# in .NET Standard 2.0, which allows its use in multiple platforms, such as Windows, Linux, Mac, IOS, Android, so on.
- The UltraDES Project is composed of the UltraDES library, a wrapper to Python and a Web Application.
- Are available algorithms in the context of Supervisory Control Theory, but also some basic functions for Petri nets.
- The software was conceived of by me and has been developed, under my guidance and supervision, by my undergraduate student **Lucas Vinícius Ribeiro Alves**, that has become a M. Sc. student and later on a Ph.D. student. He co-supervised other undergraduate students such as ***Lucas Rangel Rodrigues Martins***, **Adriano de Araújo Abreu Mourão** and **Nelson Filipe Araujo Dias** in the development of functionalities.
- UltraDES 2.2 was released and is available to download at

https://github.com/lacsed/UltraDES

INVITED PRESENTATIONS AT UNIVERSITIES, INSTITUTES AND COMPANIES

ABENGE – Brazilian Association of Engineering Education (Remote Delivery), Live Panel in celebration of the International Women in Engineering Day, June 2021.

Universidad de Santiago de Chile, Production Planning in Flexible Manufacturing Cells with Supervisory Control Theory, June 2019, Invited by: Karina Acosta Barbosa

University of Michigan, Task Scheduling in Flexible Manufacturing Cells with Supervisory Control: Evolutionary Algorithms, Pure DES approach. August 2015. Invited by Prof. Stéphane Lafortune

Universidade Federal do Amazonas, Controle Supervisório de Sistemas a Eventos Discretos: Introdução, aplicações, February 2014. Invited by Prof. Lucas Cordeiro.

Chalmers University of Technology, Verification of Nonconflict of Supervisors Using Abstractions September 2006. Invited by Prof. Martin Fabian

INVITED SHORT-TERM RESEARCH VISITS

Visiting professor in the **Universidad de Santiago de Chile**, June 1-12, 2019. Invited by Prof. Karina Acosta Barbosa (fully funded by the *Programa de Escala Docente* from AUGM – Associação das Universidades do Grupo Montevideo.

Visiting researcher in the **Chalmers University of Technology**, the Goteborg, Sweden, 5 days in September 2006. Invited by Prof. Martin Fabian

PROFESSIONAL MEMBERSHIPS

- Member, Sociedade Brasileira de Automática

REFERENCES

Available upon request.