Anexa 15 la REGULAMENTUL INSTITUȚIONAL privind organizarea și funcționarea studiilor universitare de doctorat în școlile doctorale din Universitatea „Dunărea de Jos" din Galați

IOSUD - UNIVERSITATEA „DUNĂREA DE JOS" DIN GALAȚI

Memoriul științific al studentului doctorand

MEMORIU ȘTIINȚIFIC
Drd. Ing. Georgian SIMION

Studii de doctorat

Perioada: **01.10.2021 – 30.06.2026**
Conducător științific: **Prof. univ. dr. ing. Adrian FILIPESCU**
Domeniul de doctorat: **Ingineria Sistemelor**
Titlul tezei de doctorat: **Conducerea IoT Cloud a liniilor de producție mecatronice asistate de sisteme robotice cyber fizice, în contextul industriei și educației 4.0/5.0**

Activitate științifică

A. Lista de lucrări științifice (articole în reviste sau volume):

1. Adriana Filipescu; **Simion, G.**; Filipescu, A.; Ionescu, D. IoT–Cloud-Based Control of a Mechatronic Production Line Assisted by a Dual Cyber–Physical Robotic System Within Digital Twin, AI and Industry/Education 4.0/5.0 Frameworks. Sensors 2026, 26, 3194, WOS:001775469400001, ISSN:1424-8220, https://doi.org/10.3390/s26103194

2. Adriana Filipescu; **Simion, G.**; Filipescu, A.; Ionescu, D., "IoT–Cloud-Based Control of a Mechatronic Production Line Assisted by a Dual Cyber–Physical Robotic System Within Digital Twin, AI and Industry/Education 4.0/5.0 Frameworks," Sensors 2026, 26, 3194, https://doi.org/10.20944/preprints202604.1734.v1

3. Ionescu, D.; Filipescu, A.; **Simion, G.**; Adriana Filipescu. Internet of Things-Cloud Control of a Robotic Cell Based on Inverse Kinematics, Hardware-in-the-Loop, Digital Twin, and Industry 4.0/5.0. Sensors 2025, 25, 1821, WOS:001405432100001, ISSN:1424-8220, https://doi.org/10.3390/s25061821

4. Ionescu, D.; Filipescu, A.; **Simion, G.**; Adriana Filipescu, "IoT-Cloud and Digital Twin Approach for HIL Structure Based on Inverse Kinematics Model and PLC for Controlling a Robotic Cell in the Framework of Industry 4.0," Sensors 2025, 25, 1821, https://doi.org/10.20944/preprints202502.0693.v1

5. **Simion, G.**; Filipescu, A.; Ionescu, D.; Adriana Filipescu. Cloud/VPN-Based Remote Control of a Modular Production System Assisted by a Mobile Cyber–Physical Robotic System - Digital Twin Approach. Sensors 2025, 25, 591, WOS:001453930500001, ISSN:1424-8220, https://doi.org/10.3390/s25020591

6. **Simion, G.**; Filipescu, A.; Ionescu, D.; Adriana Filipescu, "Cloud/VPN Based Remote Control of a Modular Production System Assisted by a Mobile Cyber Physical Robotic System-Digital Twin Approach," Sensors 2025, 25, 591, https://doi.org/10.20944/preprints202412.0302.v1

7. D. Ionescu, A. Filipescu, **G. Simion**, R. Şolea, Adriana Filipescu and A. Şerbencu, "PLC Inverse Kinematics Model-Driven Digital Twin Focused on HIL for a Flexible Robotic Cell," 2024 18th International Conference on Control, Automation, Robotics and Vision (ICARCV), Dubai, United Arab Emirates, 2024, pp. 1195-1200, WOS:001435120000191, ISSN:2474-2953, https://doi.org/10.1109/icarcv63323.2024.10821631

8. Filipescu, A.; **Simion, G.**; Ionescu, D.; Adriana Filipescu. IoT-Cloud, VPN, and Digital Twin-Based Remote Monitoring and Control of a Multifunctional Robotic Cell in the Context of AI, Industry, and Education 4.0 and 5.0. Sensors 2024, 24, 7451, WOS:001377771600001, ISSN:1424-8220, https://doi.org/10.3390/s24237451

9. Filipescu, A.; **Simion, G.**; Ionescu, D.; Adriana Filipescu, "IoT-Cloud, VPN, and Digital Twin-Based Remote Monitoring and Control of a Multifunctional Robotic Cell in the Context of AI, Industry, and Education 4.0 and 5.0," Sensors 2024, 24, 7451, https://doi.org/10.20944/preprints202410.1345.v1

10. A. Filipescu, I. Stamatescu, **G. Simion**, D. Ionescu and Adriana Filipescu, "IoT-Cloud based Control of a Flexible Assembly/Disassembly Mechatronic System in the Framework of Industries 4.0 and 5.0," 2024 IEEE 18th International Conference on Control & Automation (ICCA), Reykjavík, Iceland, 2024, pp. 534-539, WOS:001294388500088, ISSN:1948-3449, https://doi.org/10.1109/icca62789.2024.10591866

11. A. Filipescu, **G. Simion**, D. Ionescu and Adriana Filipescu, "Remote Control of a Flexible Robotic Cell as a Cyber Physical System for Assembly and Disassembly Based on SCADA and Industry 4.0," 2024 32nd Mediterranean Conference on Control and Automation (MED), Chania - Crete, Greece, 2024, pp. 634-639, WOS:001565329000105, ISSN:2473-3504, https://doi.org/10.1109/med61351.2024.10566234

12. A. Filipescu, D. Cernega, R. Şolea, Adriana Filipescu, E. Mincă, D. Ionescu and **G. Simion**, "Modeling and Control an A/DT Served by an ACPS based on SCADA, Industry 4.0 and 5.0," 2023 IEEE 28th International Conference on Emerging Technologies and Factory Automation (ETFA), Sinaia, Romania, 2023, pp. 1-8, ISSN:1946-0759, https://doi.org/10.1109/etfa54631.2023.10275349

13. A. Filipescu, E. Mincă, D. Cernega, R. Şolea, Adriana Filipescu, **G. Simion** and D. Ionescu, "Digital Twin Based a Processing Technology Assisted by a MCPRS, Ready for Industry 5.0," 2023 27th International Conference on System Theory, Control and Computing (ICSTCC), Timisoara, Romania, 2023, pp. 297-302, ISSN:2473-5698, https://doi.org/10.1109/icstcc59206.2023.10308478

14. A. Filipescu, D. Cernega, E. Mincă, R. Şolea, D. Ionescu, **G. Simion** and Adriana Filipescu, "Digital Twin for a Mechatronics Line with Integrated Mobile Robotic Systems," 2022 26th International Conference on System Theory, Control and Computing (ICSTCC), Sinaia, Romania, 2022, pp. 163-169, WOS:000889980600029, ISSN:2372-1618, https://doi.org/10.1109/icstcc55426.2022.9931782

15. A. Filipescu, R. Şolea, D. Cernega, D. Ionescu, **G. Simion** and Adriana Filipescu, "Complex Autonomous System Assisting a Manufacturing Technology on a Mechatronics Line. A Digital Twin Approach," 2022 26th International Conference on System Theory, Control and Computing (ICSTCC), Sinaia, Romania, 2022, pp. 157-162, WOS:000889980600028, ISSN:2372-1618, https://doi.org/10.1109/icstcc55426.2022.9931812

16. Mincă, E.; Filipescu, A.; Cernega, D.; Șolea, R.; Adriana Filipescu; Ionescu, D.; **Simion, G.** Digital Twin for a Multifunctional Technology of Flexible Assembly on a Mechatronics Line with Integrated Robotic Systems and Mobile Visual Sensor - Challenges towards Industry 5.0. Sensors 2022, 22, 8153, WOS:000881435200001, ISSN:1424-8220, https://doi.org/10.3390/s22218153

17. **Simion, G.**; Filipescu, A.; Ionescu, D.; Șolea, R.; Cernega, D.; Mincă, E.; Adriana Filipescu. Mobile Visual Servoing Based Control of a Complex Autonomous System Assisting a Manufacturing Technology on a Mechatronics Line. Inventions 2022, 7, 47, WOS:000858232500001, ISSN:2411-5134, https://doi.org/10.3390/inventions7030047

18. Ionescu, D.; Filipescu, A.; **Simion, G.**; Mincă, E.; Cernega, D.; Șolea, R.; Adriana Filipescu. Communication and Control of an Assembly, Disassembly and Repair Flexible Manufacturing Technology on a Mechatronics Line Assisted by an Autonomous Robotic System. Inventions 2022, 7, 43, WOS:000818151300001, ISSN:2411-5134, https://doi.org/10.3390/inventions7020043

19. D. Ionescu, D. Cernega, R. Șolea, A. Filipescu, **G. Simion** and Adriana Filipescu, "CAS and IRM Integrated into a Multifunctional Flexible Manufacturing Technology on an A/D/RML," 2021 25th International Conference on System Theory, Control and Computing (ICSTCC), Iasi, Romania, 2021, pp. 541-546, WOS:000859487900089, ISSN:2372-1618, https://doi.org/10.1109/icstcc52150.2021.9607127

20. Adriana Filipescu; Ionescu, D.; Filipescu, A.; Mincă, E.; **Simion, G.** Multifunctional Technology of Flexible Manufacturing on a Mechatronics Line with IRM and CAS, Ready for Industry 4.0. Processes 2021, 9, 864, WOS:000654500500001, ISSN:2227-9717, https://doi.org/10.3390/pr9050864

B. Participări la conferințe/workshop-uri

1. 2022, Scientific Conference of Doctoral Schools SCDS-UDJG Perspectives and challenges in doctoral research 10th Edition, "Dunarea de Jos" University of Galati, Galați, Romania, 9-10 of June 2022

C. Proiecte de cercetare științifică

1. **Asistent de cercetare în automatică**, 01.12.2018-31.08.2022, membru în echipa proiectului complex "Conducerea inteligentă și distribuită a 3 sisteme autonome complexe integrate în tehnologii emergente către asistare personală medico-socială și deservire de linii de fabricație flexibilă de precizie", cod proiect PN-III-P1-1.2-PCCDI-2017-0290, finanțat prin contractul nr.78PCCDI/2018.

Student-doctorand