

Raport de autoevaluare¹ (2022)

1. Date de identificare

- 1.1. Denumire²: **Sisteme de conducere automată a proceselor (SCAP)**
- 1.2. Document de înființare³: **Certificat de înființare acordat de CNC SIS nr. 35/CC-C 2001**
- 1.3. Pagina web (limba română, limba engleză): www.scap.ugal.ro
- 1.4. Adresa: **Universitatea „Dunărea de Jos” din Galați, Facultatea Automatică, Calculatoare, Inginerie Electrică și Electronică, Galați, Str. Științei nr.2 corp Y**
- 1.5. Telefon, fax, e-mail: 0336130298, fax 0336130299, e-mail: daniela.cernega@ugal.ro

2. Scurtă prezentare

- 2.1. Domeniul fundamental/ramura de știință⁴: **Științe inginerești/Ingineria Sistemelor**
- 2.2 Direcții de cercetare-dezvoltare/obiective de cercetare/priorități de cercetare
 - a. Conducerea proceselor neliniare (modelarea, estimarea stării și controlul proceselor de tratare biologică a apelor reziduale, conducerea roboților mobili și a sistemelor flexibile de fabricație);
 - b. Optimizări discrete (Conducerea și optimizarea proceselor continue și cu evenimente discrete).

3. Structura de conducere a centrului

- 3.1. Coordonator (Director/Responsabil) **Conf.dr.ing Daniela Cristina CERNEGA**
- 3.2. Consiliul de conducere/științific **Prof.dr.ing. Sergiu CARAMAN, Prof.dr.ing. Marian BARBU**

4. Structura resursei umane

4.1. Numărul total de membri (a+b):18

- a. Număr membri titulari⁵ 18 : Daniela Cristina CERNEGA, Sergiu CARAMAN, Viorel MÎNZU, Adrian FILIPESCU, Marian BARBU, Răzvan ȘOLEA, George IFRIM, Adrian ȘERBENCU, Bogdan CODREȘ, Laurențiu LUCA, Adriana FILIPESCU, Larisa DIACONU, Iulian VASILIEV, Dan IONESCU, Georgian SIMION, Liliana GHINEA, Bogdan ROSU, Ira Adeline SIMIONOV

¹ Se întocmește și se predă anual.

² Inclusiv acronim.

³ Se specifică numărul și data actului de înființare (Hotărâre de Senat, Decizie etc.)

⁴ In acord cu Hotărârea nr. 433/2022 privind aprobarea Nomenclatorului domeniilor și al specializărilor/ programelor de studii universitare și a structurii instituțiilor de învățământ superior pentru anul universitar 2022-2023.

⁵ Conform metodologiei, nr.membrilor titulari din UC trebuie sa fie minim 50% din totalul membrilor UC (membrii titulari pot fi doar cadre didactice angajate la UDJG cu contract de muncă pe perioadă nedeterminată). Un membru titular trebuie sa aibă afiliere la cel mult o unitate de cercetare.

b. Număr membri asociați: 0

din care:

- Conducători de doctorat⁶: -4 conform tabelului 4.1
- Număr de tineri cercetatori (postdoctoranzi, doctoranzi, masteranzi etc): 14
- Număr ingineri/tehnicieni: 0

5. Infrastructura de cercetare-dezvoltare, facilități de cercetare

5.1. Laboratoare/compartimente⁷: 2, conform Tabel 5.1

5.2. Echipamente, instalații și software de interes național pentru cercetare fundamentală, dezvoltare tehnologică și inovare⁸: -conform cu Tabelul 5.2,

6. Contracte de cercetare derulate⁹

6.1. Contracte câștigate în competiții: -corelat cu Tabel 6.1.

- internaționale 2
- naționale 4

6.2. Contracte cu agenți economici: -corelat cu Tabel 6.2.

- din străinătate 0
- din țară 0

7. Rezultatele activității de cercetare, dezvoltare și inovare (CDI)

7.1. Rezultate ale activității CDI (cercetare fundamentală și aplicativă)¹⁰

		Nr.
7.1.1	Lucrări publicate în reviste cotate ISI- conform Tabel 7.1.1	11
7.1.2	Factor de impact cumulat al lucrărilor cotate ISI- conform Tabel 7.1.1	28.915
7.1.3	Citări în reviste de specialitate cotate ISI.	98
7.1.4	Lucrări științifice/tehnice în reviste indexate în baze de date internaționale -corelat cu Tabel 7.1.4.	0
7.1.5	Comunicări științifice prezentate la conferințe internaționale- conform Tabel 7.1.5.	17
7.1.6	Comunicări științifice prezentate la conferințe naționale - conform Tabel 7.1.6.	1
7.1.7	Brevete de invenție (solicitate / acordate)-conform Tabel 7.1.7	1
7.1.8	Citări în sistemul ISI ale cercetărilor brevetate.	34
7.1.9	Produse/servicii/tehnologii rezultate din activități de cercetare, bazate pe brevete, omologări sau inovații	3

⁶ Nume, prenume, domeniul de doctorat.

⁷ Se vor nominaliza laboratoarele, responsabilul și principalele direcții de cercetare; în cazul laboratoarelor, se vor nominaliza compartimentele/colectivele de cercetare,

⁸ Se se vor enumera numai acele laboratoare și acele echipamente care au fost folosite în activitatea de cercetare din ultimii 2 ani); Se vor nominaliza 1-2 reperi reprezentative la nivel de universitate, regional și național.

⁹ Se vor atasa liste pe categorii, care să cuprindă următoarele detalii: nr. contract, titlu, **domeniul** (care se înscrie în lista domeniilor de cercetare declarate ale centrului) de cercetare, director/responsabil UC, parteneri (dacă este cazul), valoarea totală, valoarea regiei și valoarea din regie care a fost solicitată pentru întreținerea centrului.

¹⁰ Se vor anexa lista acestor contribuții.

	proprii- conform u Tabel 7.1.9.	
7.1.10	Studii prospective și tehnologice, normative, proceduri, metodologii și planuri tehnice, noi sau perfecționate, comandate sau utilizate de beneficiar- conform Tabel 7.1.10.	0

7.2. Teze de doctorat finalizate și în derulare¹¹:

1 teza finalizata

6 teze in derulare-6, conform Tabel 7.2.

7.3. Oportunități de valorificare a rezultatelor CDI.

7.4. Rezultate ale activității CDI valorificate și efectele obținute

8. Măsurile privind creșterea capacității activității CDI¹².

-proponeri de proiecte in competitii

-cresterea resursei umane prin actitatile de conducere de doctorat

- cresterea vizibilitati prin conferintele internationale la organizate sub patrinajul organizatiilor mondiale (IEEE): ICSTCC 2023 [ICSTCC 2023 – 27th International Conference on System Theory, Control and Computing, October 11-13, 2023, Timisoara, Romania \(upt.ro\)](http://icstcc2023.org/) <http://ieeecss.org/conferences/technically-co-sponsored-conferences>, ECC 2023 [Home - ECC23 \(euca-ecc.org\)](http://euca-ecc.org/), ETFA2023 [2023 ETFA – IEEE 28th International Conference on Emerging Technologies and Factory Automation - IEEE Industrial Electronic Technology News \(ITeN\) \(iee-ies.org\)](http://www.ieee.org/conferences/ETFA2023).

9. Măsurile pentru creșterea prestigiului și a vizibilității Centrului de cercetare¹³

9.1. Dezvoltarea de parteneriate:

- dezvoltarea de parteneriate la nivel național și internațional (cu personalități/instituții / asociații profesionale) în vederea participării la programele naționale și europene specifice;
 - parteneriat cu Universitat Autònoma de Barcelona, School of Engineering
- înscrierea Centrului de cercetare în asociații profesionale de prestigiu pe plan național/internațional;
 - CSS IEEE Joint conference ICSTCC
 - ECC 2023
 - ETFA2023
- personalități științifice care au vizitat Centrul de cercetare;
 - Prof. Dr. Ramon Vilanova Arbos, Dean School of Engineering, Universitat Autònoma de Barcelona
- membrii în colectivele de redacție ale revistelor recunoscute ISI (sau incluse în baze internaționale de date) și în colective editoriale internaționale și/sau naționale:
 - Prof.dr.ing. Marian BARBU,
 - Prof.dr.ing Sergiu CARAMAN,
 - Conf.dr.ing. Răzvan ȘOLEA.

9.2. Prezentarea rezultatelor la târgurile și expozițiile naționale și internaționale;

- târguri și expozitii internaționale;
- târguri și expoziții naționale.

¹¹ Se va anexa lista tezelor de doctorat în derulare, cu specificarea titlului, domeniului de doctorat, numelui doctoranzilor, numelui conducătorului de doctorat.

¹² Se va descrie detaliat fiecare acțiune realizată.

¹³ Se va descrie detaliat fiecare acțiune realizată.

9.3. Premii obținute prin proces de selecție/distincții etc.

9.4 Prezentarea activității de mediatizare:

- extrase din presă (interviuri);
- participare la dezbateri radiodifuzate / televizate.

Data:27.03.2023

Director/ Responsabil unitate de cercetare

The logo for Storrega is written in a blue, cursive script. Below the main name, there is a smaller line of text in a sans-serif font, which appears to be "STORREGA" followed by some smaller, less legible text.

ANEXE**Tabel 4.1.****Conducători de doctorat din cadrul UC**

Nr.crt.	Nume și Prenume	Domeniul de doctorat
1	Prof.dr.habil.ing. Marian BARBU	Ingineria Sistemelor
2	Prof.dr.ing. Sergiu CARAMAN	Ingineria Sistemelor
3	Prof.dr.ing. Adrian FILIPESCU	Ingineria Sistemelor
4	Prof.dr.ing. Viorel MÎNZU	Ingineria Sistemelor

Tabel 5.1.**Laboratoare/ compartimente ale UC**

Nr.crt.	Denumire Laborator/ Compartiment UC	Responsabil Laborator/ Compartiment	Direcții de cercetare
1	Sisteme de control a proceselor biotehnologice APEPUR	Conf.dr.ing. George IFRIM	Conducerea proceselor biotehnologice din domeniile apelor uzate si fotobioreactoarelor
2	Sisteme de control a proceselor neliniare SISCONTROL	Conf.dr.ing. Răzvan ȘOLEA	Conducerea sistemelor de roboti mobili si a sistemelor de flexibile de asamblare si fabricație

Tabel 5.2.

Echipe, instalații și software de interes național pentru cercetare fundamentală, dezvoltare tehnologică și inovare – doar repere reprezentative la nivelul UC

Nr.crt.	Denumire echipament	Anul achiziției
1	Celula flexibilă de asamblare/dezasamblare echipată cu manipulator industrial ABB IRM	2021
2	Fotobioreactor -	2019

Tabel 6.1.

Contracte/Granturi câștigate în competiții naționale/ internaționale

Nr.crt.	Nr.contract	Titlu proiect	Tip finanțare (național / internațional)	Domeniul de cercetare	UDJG coordonator / partener	Director contract	Perioada de derulare	Valoarea contractului alocat UDJG
1	Proiectul nr. 621764- EPP-1-2020-1-NO-EPPKA2-KA	Digitalisation of water industry by innovative graduate water education / DIGIWATER	internațional		partener	Prof.dr.ing. Marian BARBU	2020-2024	
2	Proiect ID 536/2021	Exelență și implicare în dezvoltarea inteligență bazată pe cercetare și inovare la Universitatea Dunărea de Jos din Galați (UDJG) – DINAMIC	național		partener	Prof.dr.ing. Marian BARBU		
3	PN-III-P1-1.1-TE-2019-2062. Contract nr. TE 64 / 2020	Modelarea și controlul mecanismelor de stres subletal la microalge în spiritul conceptului de biorafinare (ReSuLS).	național		coordonator	Conf.dr.ing. George IFRIM	2020-2022	

4	PN-III-P2-2.1-PTE2019-0697. Contract nr. 51 PTE / 2020	Optimizarea Tehnologiilor de Creștere a Biomasei Piscicole și Vegetale în Cadrul Sistemelor Multi-Trofice de Acvacultura Intensivă prin Utilizarea Tehnicilor Inteligente de Recunoaștere Vizuală și IoT (MULTIAQUAIOT)	național		coordonator	Conf.dr.ing. George IFRIM	2020-2022	
5	Contract de finanțare din sursa Fondul Social European (FSE) – POSCCE, POCU, TIC, POR Nr. contract: 12/01.09.2016	Transfer de cunoștințe privind creșterea eficienței energetice și sisteme inteligente de putere CRESC-INTEL -	național		coordonator	Prof.dr.ing. Marian Gaiceanu		
6	Grant Agreement nr. 899469/2020	<i>Innovative high efficiency power system for machines and devices, increasing the level of work safety in underground mining excavations” (HEET II)</i>	internațional		partener	Prof.dr.ing. Marian Gaiceanu		

Articole în reviste cotate ISI

Nr.crt.	Date de identificare articol (Autori, Titlu, cod DOI articol, Titlul revistei, anul publicării)	Factor de impact
1	Model Based Optimal Control of the Photosynthetic Growth of Microalgae in a Batch Photobioreactor; By: Ifrim, GA (Ifrim, George Adrian); Titica, M (Titica, Mariana); Horincar, G (Horincar, Georgiana); Antache, A (Antache, Alina); Baicu, L (Baicu, Laurentiu); Barbu, M (Barbu, Marian); Guzman, JL (Guzman, Jose Luis); Energies; SEP 2022; DOI 10.3390/en15186535; Impact factor 3.252	3.252
2	Optimal Control Strategy of a Sewer Network; By: Vasiliev, I (Vasiliev, Iulian); Luca, L (Luca, Laurentiu); Barbu, M (Barbu, Marian); Vilanova, R (Vilanova, Ramon); Caraman, S (Caraman, Sergiu); WATER; APR 2022; DOI: 10.3390/w14071062; Impact factor 3.53	3.53
3	New approach for regulation of the internal recirculation flow rate by fuzzy logic in biological wastewater treatments; By: Santin, I (Santin, I); Vilanova, R (Vilanova, R.); Pedret, C (Pedret, C.); Barbu, M (Barbu, M.); ISA Transactions; JAN 2022; Impact factor 5.911	5.911
4	Gassenmeier V, Deppe S, Rodriguez TH, Kuhfuss F, Moser A, Hass VC, Kuchemuller KB, Portner R, Moller J, Ifrim G, Frahm B. Current Research in Biotechnology. 2022; 4:102-118. https://doi.org/10.1016/j.crbiot.2022.01.005	3.252
5	Kuhfuss F, Gassenmeier V, Deppe S, Ifrim G, Rodriguez TH, Frahm B. View on a mechanistic model of Chlorella vulgaris in incubated shake flasks. Bioprocess and Biosystems Engineering. 2021; https://doi.org/10.1007/s00449-021-02627-2	3.43
6	Ionescu, D.; Filipescu, A.; Simion, G.; Cernega, D. ; Şolea, R.; Filipescu, A. 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(2), 43; https://doi.org/10.3390/inventions7020043 , https://www.mdpi.com/2411-5134/7/2/43 , Accession Number: WOS:000818151300001	0.81
7	Simion, G.; Filipescu, A.; Ionescu, D.; Şolea, R.; Cernega, D. ; Mincă, E.; Filipescu, A. Mobile Visual Servoing Based Control of a Complex Autonomous System Assisting a Manufacturing Technology on a Mechatronics Line. Inventions 2022, 7(3), 47; https://doi.org/10.3390/inventions7030047 , https://www.mdpi.com/2411-5134/7/3/47 , Accession Number: WOS:000858232500001	0.81
8	Duca, O.; Minca, E.; Filipescu, A.; Cernega, D. ; Solea, R.; Bidica, C. Event-Based PID Control of a Flexible Manufacturing Process. Inventions 2022, 7(4), 86; https://doi.org/10.3390/inventions7040086 , https://www.mdpi.com/2411-5134/7/4/86 , Accession Number: WOS:000902580500001	0.81
9	Minca, E (Minca, Eugenia); Filipescu, A (Filipescu, Adrian); Cernega, D (Cernega, Daniela); Solea, R (Solea, Razvan); Filipescu, A (Filipescu, Adriana); Ionescu, D (Ionescu, Dan); Simion, G (Simion, Georgian), <i>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</i> , SENSORS Volume: 22 Issue: 21 Article, Sensors Free Full-Text Digital Twin for a Multifunctional Technology of Flexible Assembly on a Mechatronics Line with Integrated Robotic Systems and Mobile Visual Sensor&mdash;Challenges towards Industry 5.0 (mdpi.com) Number: 8153 DOI: 10.3390/s22218153 Published: NOV 2022, Accession Number: WOS:000881435200001, PubMed ID: 36365850	4.05
10	Minzu, V (Minzu, Viorel); Georgescu, L (Georgescu, Lucian); Rusu, E (Rusu, Eugen), Predictions Based on Evolutionary Algorithms Using Predefined Control Profiles, ELECTRONICS Volume: 11 Issue: 11 Article Number: 1682 DOI: 10.3390/electronics11111682 Published: JUN 2022 Accession Number: WOS:000808820300001	2.69
11	Modeling and Simulation of a UV Water Treatment System Fed by a GPV	0.37

	<p>Source Using the Bond Graph Approach</p> <p>Author(s): Said, R (Said, Riahi); Zitouni, N (Zitouni, Naoufel); Minzu, V (Minzu, Viorel); Mami, A (Mami, Abdelkader)</p> <p>Source: ENGINEERING TECHNOLOGY & APPLIED SCIENCE RESEARCH Volume: 12 Issue: 3 Pages: 8559-8566 Published: JUN 2022</p> <p>Accession Number: WOS:000809423300013</p> <p>ISSN: 2241-4487</p> <p>eISSN: 1792-8036</p>	
Total		28.915

7.1.3 Citări în reviste de specialitate cotate ISI.

1. [Predictive Control of aWastewater Treatment Process](#) citat în:

A. [Smart Modelling of a Sustainable Biological Wastewater Treatment Technologies: A Critical Review](#) WAH Altowayti, S Shahr, TAE Eisa, M Nasser... - Sustainability, 2022 - mdpi.com

2. [On the evaluation of the global impact of control strategies applied to wastewater treatment plants](#) citat în:

A. [A plant-wide model describing GHG emissions and nutrient recovery options for water resource recovery facilities](#), B Solís, A Guisasola, X Flores-Alsina, U Jeppsson... - Water research, 2022 - Elsevier

B. [Improving wastewater treatment plant performance based on effluent quality, operational costs, and reliability using control strategies for water and sludge ...](#)

M Rajaei, S Nazif - Process Safety and Environmental Protection, 2022 – Elsevier

3. [Fuzzy logic for plant-wide control of biological wastewater treatment process including greenhous..](#) citat în:

A. [A plant-wide model describing GHG emissions and nutrient recovery options for water resource recovery facilities](#), B Solís, A Guisasola, X Flores-Alsina, U Jeppsson... - Water research, 2022 - Elsevier

B. [Multi-objective model predictive control with gradient eigenvector algorithm](#)

H Han, C Chen, H Sun, S Du, J Qiao - Information Sciences, 2022 - Elsevier

C. [Data to Intelligence: The Role of Data-Driven Models in Wastewater Treatment](#)

M Bahramian, RK Dereli, W Zhao, M Giberti... - Expert Systems with ..., 2022 - Elsevier

D. [Multi-objective integrated optimal control for a wastewater treatment process](#)

HG Han, C Chen, HY Sun, JF Qiao - Control Engineering Practice, 2022 - Elsevier

E. [Design of intelligent control strategies for full-scale wastewater treatment plants with struvite unit](#)

AG Sheik, ESS Tejaswini, SR Ambati - Journal of Water Process ..., 2022 - Elsevier

F. [A novel grey projection incidence model for assessing the relationships between cardiovascular diseases and air pollutants](#), Y Feng, Y Dang, J Wang, Y An - ISA transactions, 2022 - Elsevier

G. [Fuzzy super-twisting sliding mode control for municipal wastewater nitrification process](#)

HG Han, T Wang, HY Sun, XL Wu, W Li... - Science China ..., 2022 – Springer

4. [Educational data mining for tutoring support in higher education: a web-based tool case study...](#) citat în:

A. [Educational data mining to support programming learning using problem-solving data](#)

MM Rahman, Y Watanobe, T Matsumoto... - IEEE ..., 2022 - ieeexplore.ieee.org

B. [Recent advances in Predictive Learning Analytics: A decade systematic review \(2012–2022\)](#)

N Sghir, A Adadi, M Lahmer - Education and Information Technologies, 2022 - Springer

C. [Analysis and prediction of students' academic performance based on educational data mining](#)

G Feng, M Fan, Y Chen - IEEE Access, 2022 - ieeexplore.ieee.org

D. [A Priori Determining the Performance of the Customized Naïve Associative Classifier for Business Data Classification Based on Data Complexity Measures](#)

CC Tusell-Rey, O Camacho-Nieto, C Yáñez-Márquez... - Mathematics, 2022 - mdpi.com

E. [On the Intelligent Computing Model of Diagnosis Teaching in Preschool Education in Colleges and Universities under the Background of Big Data](#), X Ding - Computational Intelligence and Neuroscience, 2022

F. [Pragmatic evaluation of data mining models based on quality assessment & metric analysis](#)

TG Ghongade, RN Khobragade - Procedia Computer Science, 2022 – Elsevier

5. [Control strategies for nitrous oxide emissions reduction on wastewater treatment plants operation](#) citat în:

A. [A plant-wide model describing GHG emissions and nutrient recovery options for water resource recovery facilities](#), B Solís, A Guisasola, X Flores-Alsina, U Jeppsson... - Water research, 2022 - Elsevier

- B. [Improving the quality of wastewater treatment plant monitoring by adopting proper sampling strategies and data processing criteria](#), G Bertanza, R Boiocchi, R Pedrazzani - Science of The Total Environment, 2022
- C. [Evaluating the potential impact of energy-efficient ammonia control on the carbon footprint of a full-scale wastewater treatment plant](#), R Boiocchi, G Bertanza - Water Science and Technology, 2022 - iwaponline.com
- D. [Initial effects of post-harvest ditch cleaning on greenhouse gas fluxes in a hemiboreal peatland forest](#) CHM Tong, MB Nilsson, U Sikström, E Ring, A Drott... - Geoderma, 2022 - Elsevier
- E. [The trade-off between N2O emission and energy saving through aeration control based on dynamic simulation of full-scale WWTP](#)
A Abulimiti, X Wang, J Kang, L Li, D Wu, Z Li, Y Piao... - Water Research, 2022 - Elsevier
- F. [Multiobjective Operation Optimization of Wastewater Treatment Process Based on Reinforcement Self-Learning and Knowledge Guidance](#)
P Zhou, X Wang, T Chai - IEEE Transactions on Cybernetics, 2022 - ieeexplore.ieee.org
- G. [A hierarchical intelligent control strategy for greenhouse gas reduction in wastewater treatment process of paper mill](#), F Huang, W Li, W Shen, P Seferlis, Y Man... - Journal of Cleaner ..., 2022 - Elsevier
- H. [Improving wastewater treatment plant performance based on effluent quality, operational costs, and reliability using control strategies for water and sludge ...](#)
M Rajaei, S Nazif - Process Safety and Environmental Protection, 2022 - Elsevier
- I. [Design of intelligent control strategies for full-scale wastewater treatment plants with struvite unit](#)
AG Sheik, ESS Tejaswini, SR Ambati - Journal of Water Process ..., 2022 - Elsevier

6. Articol citat:

Solea, R., Nunes, U.: *Trajectory planning and sliding-mode control based trajectory-tracking for cybercars. Integrated Computer Aided Engineering* 13(1), 1–15 (2007)

A. [Yuan, TF; Zhao, RC; LQR-MPC-Based Trajectory-Tracking Controller of Autonomous Vehicle Subject to Coupling Effects and Driving State Uncertainties; SENSORS, Volume 22; Issue 15; Article Number 5556; DOI: 10.3390/s22155556, WOS:000839878000001](#)

B. [Jeong, D; Choi, SB; Tracking Control Based on Model Predictive Control Using Laguerre Functions With Pole Optimization; IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, Volume 23; Issue 11; Page 20652-20663; DOI: 10.1109/TITS.2022.3179613, WOS:000826393900001](#)

7. Articol citat:

Solea, R., Nunes, U.: *Trajectory planning and sliding-mode control based trajectory-tracking for cybercars. Integrated Computer Aided Engineering* 13(1), 1–15 (2007)

A. [Hacohen, S; Medina, O; Shoval, S; Autonomous Driving: A Survey of Technological Gaps Using Google Scholar and Web of Science Trend Analysis; IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS; Volume 23; Issue 11; Page 21241-21258; DOI: 10.1109/TITS.2022.3172442, WOS:000795112200001](#)

B. [Qiu, B; Wei, LT; Wang, XY; Li, L; Zhou, DL; Wang, ZF; Path tracking of autonomous vehicle based on adaptive preview trajectory planning with the consideration of vehicle stability; PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART D-JOURNAL OF AUTOMOBILE ENGINEERING; Article Number 09544070221094112; DOI: 10.1177/09544070221094112, WOS:000786661100001](#)

C. [Deshpande, P; Devika, KB; Subramanian, SC; Vanajakshi, LD; Robust steering control for trajectory following in road traffic environments; PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART I - JOURNAL OF SYSTEMS AND CONTROL ENGINEERING; Volume 236; Issue 1; Page 153-168; Article Number 09596518211014318; DOI: 10.1177/09596518211014318, WOS:000680611800000](#)

D. [Hu, JQ; Zhang, YM; Rakheja, S; Adaptive Trajectory Tracking for Car-Like Vehicles With Input Constraints; IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS; Volume 69; Issue 3; Page: 2801-2810; DOI: 10.1109/TIE.2021.3068672, WOS:000728182300062](#)

8. **Articol citat** Solea, R, Cernega, D. „Super twisting sliding mode controller applied to a nonholonomic mobile robot modeling”. In: 2015 19th international conference on system theory, control and computing (ICSTCC), Cheile Gradistei, Romania, October 2015. IEEE

A. [Hu, JQ; Zhang, YM; Rakheja, S; Adaptive Trajectory Tracking for Car-Like Vehicles With Input Constraints; IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS; Volume 69; Issue 3; Page: 2801-2810; DOI: 10.1109/TIE.2021.3068672, WOS:000728182300062](#)

9. Articol citat:

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A. [Elayaperumal, D.](#); [Joo, YH.](#); *Robust Swarm Formation for Multiple Nonholonomic Two-Wheeled Mobile Robots Using Leader-Follower Approach via Sliding Mode Controller and Neural Dynamic Model*; [JOURNAL OF ELECTRICAL ENGINEERING & TECHNOLOGY](#); DOI: 10.1007/s42835-022-01235-8, **WOS:000842871100005**

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A. [Szrek, J.](#); [Jakubiak, J.](#); [Zimroz, R.](#); A Mobile Robot-Based System for Automatic Inspection of Belt Conveyors in Mining Industry; [ENERGIES](#); Volume 15; Issue 1; Article Number 327; DOI: 10.3390/en15010327, **WOS:000752548800001**

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Tabel 7.1.4.

Articole în reviste indexate BDI

Nr.crt.	Date de identificare articol (Autori, Titlu articol, Volum, pagină / nr. articol)	Denumirea bazei de date

Tabel 7.1.5.

Comunicări științifice prezentate la conferințe internaționale

Nr.crt.	Autori, Titlul lucrării	Titlul conferinței	Perioada	Organizator
1	Anaerobic Digestion Process Controller Tuning Using Fictitious Reference Iterative Method; By: <i>Condrachi, L (Condrachi, Larisa); Barbu, M (Barbu, Marian);</i> DOI 10.1016/j.ifacol.2022.07.485;	13th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS), 2022	14-17 June 2022	IFAC
2	Multi-optimization approach for PID control on Drone roll-pitch orientation, <i>O Arrieta, D Campos, JD Rojas, M Barbu, R Vilanova,</i> 2022 23rd International Carpathian Control Conference (ICCC), 227-232	International Carpathian Control Conference (ICCC)	Sept 2022	

3	Sewer Network Model of a City with a Medium-Sized Population, <i>I Vasiliev, L Luca, M Barbu, R Vilanova, S Caraman</i> , 2022 23rd International Carpathian Control Conference (ICCC), 107-112	International Carpathian Control Conference (ICCC)		
4	G. Ifrim, G. Horincar, L. Condrachi, M. Titica and J. L. Guzman, "Fictitious Reference Iterative Tuning Control of the pH in a Photobioreactor," <i>2022 26th International Conference on System Theory, Control and Computing (ICSTCC)</i> , October 19-21, 2022, Sinaia, Romania, Editors: Marian Barbu, Răzvan Şolea, IEEE Catalog Number: CFP2236P-ART, ISBN: 978-1-6654-6746-9, pp. 519-523, https://doi.org/10.1109/ICSTCC55426.2022.9931867 , WOS:000889980600087	CSS IEEE ICSTCC	October 19-21, 2022	
5	Vasiliev, L. Luca, R. Vilanova and S. Caraman, "Optimal Control of a Sewer Network," 2022 26th International Conference on System Theory, Control and Computing (ICSTCC), Sinaia, Romania, 2022, pp. 80-85, doi: 10.1109/ICSTCC55426.2022.9931810	CSS IEEE ICSTCC	October 19-21, 2022	
6	I. Vasiliev, L. Luca, R. Vilanova and S. Caraman, "Sewer Network Modelling and Control – A Literature Review," 2022 26th International Conference on System Theory, Control and Computing (ICSTCC), Sinaia, Romania, 2022, pp. 58-63, doi: 10.1109/ICSTCC55426.2022.9931870	CSS IEEE ICSTCC	October 19-21, 2022	
7	Ungureanu, C., Horincar, G., Mogodan, A., Ifrim, G. Effect of nitrogen and phosphorus concentrations on the growth of a freshwater microalga <i>Desmodesmus</i> sp. Cultivated in a continuous photobioreactor, International Summer Conference, 2-4 iunie 2022, Chişinău, Republica Moldova (Poster)		iunie 2022	
8	Simionov, I., Ifrim, G., Antache, A. Monitoring the gas dynamics in flat panel air-lift photobioreactor, International Summer Conference, 2-4 iunie 2022, Chişinău, Republica Moldova (Poster)		iunie 2022	
9	Horincar, G., Ungureanu, C., Mogodan, A., Ifrim, G. Production of lipids and pigments by <i>Desmodesmus pseudocommunis</i> with potential applications in biorefinery and food industries, International Summer Conference, 2-4 iunie 2022, Chişinău, Republica Moldova (Poster)		iunie 2022	
10	Alexandru Codreş, Bogdan Codreş, Alexandru, Stancu - Guaranteed SLAM - A pure interval approach, 2022 26th International Conference on System Theory, Control and Computing (ICSTCC) 19-21 Oct. 2022 Sinaia. Publication Year: 2022	CSS IEEE ICSTCC	October 19-21, 2022	
11	<i>Event-based PID control in a flexible manufacturing process</i> , Duca, O; Minca, E Filipescu, A; Solea, R; Cernega, D; Paun, M Edited by: Barbu M; Solea R, 2022 26TH INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 182-187, https://DOI:10.1109/ICSTCC55426.2022.9931787	CSS IEEE ICSTCC	October 19-21, 2022	
12	Complex Autonomous System Assisting a Manufacturing Technology on a Mechatronics Line. A Digital Twin Approach, Author(s): Filipescu, A (Filipescu, Adrian); Solea, R (Solea, Razvan); Cernega, DC (Cernega, Daniela Cristina); Ionescu, D (Ionescu, Dan); Simion, G (Simion, Georgian); Filipescu, A (Filipescu, Adriana), Edited by: Barbu M; Solea R, 2022 26TH INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) : International Conference on System Theory Control and Computing Pages: 157-162,	CSS IEEE ICSTCC	October 19-21, 2022	

	https://DOI:10.1109/ICSTCC55426.2022.9931812 Published: 2022 , Accession Number: WOS:000889980600028,			
13	: Digital Twin for a Mechatronics Line with Integrated Mobile Robotic Systems, Author(s): Filipescu, A (Filipescu, Adrian); Cernega, DC (Cernega, Daniela Cristina); Minca, E (Minca, Eugenia); Solea, R (Solea, Razvan); Ionescu, D (Lonescu, Dan); Simion, G (Simion, Georgian); Filipescu, A (Filipescu, Adriana), Edited by: Barbu M; Solea R, Source: 2022 26TH INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing , Pages: 163-169, https://DOI:10.1109/ICSTCC55426.2022.9931782 , Published: 2022 , Accession Number: WOS:000889980600029	CSS IEEE ICSTCC	October 19-21, 2022	
14	Procop I., Pacuraru F., Pacuraru S., Solea R. , Cotoc G., Caramatescu A.; Semi-Autonomous System for Lakes and Rivers Depollution; (2022) 2022 26th International Conference on System Theory, Control and Computing, ICSTCC 2022 - Proceedings, pp. 188 – 194; DOI: 10.1109/ICSTCC55426.2022.9931869 WOS:000889980600033	CSS IEEE ICSTCC	October 19-21, 2022	
15	Gaiceanu M., Buhosu R., Solea R. , Silviu E., Stankiewicz K., Skora M.; <i>Underground Mine Monitoring System</i> ; (2022) 2022 IEEE 20th International Power Electronics and Motion Control Conference, PEMC 2022, pp. 715 – 720; DOI: 10.1109/PEMC51159.2022.9962893 (IEEE Xplore)	IEEE		
16	<u>Minzu, V; Arama, I and Vlad, C</u> , Predictions based on Evolutionary Algorithms - Implementation Aspects regarding the Control Variables' Domain, 26th International Conference on System Theory, Control and Computing (ICSTCC) 2022 2022 26TH INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) , pp.349-354			

Tabel 7.1.6.

Comunicări științifice prezentate la conferințe naționale

Nr.crt.	Autori, Titlul lucrării	Titlul conferinței	Perioada	Organizator
1	Simionov I, Barbu M, Titica M, Ifrim G, Petrea SM, Antache A. A state of the art for modeling microalgae production process.	Scientific Conference of Doctoral Schools SCDS-UDJG 2022,	9-10 June, Galati, Romania	Doctoral Schools SCDS-UDJG
2	Marian Găiceanu, Razvan Buhosu, Răzvan Șolea , Silviu Epure, <i>Solution to Explosion hazards Protection in Underground Mines</i> , Perspectives and challenges in doctoral research Section S.5: Advanced research in electrical / electronic engineering, system engineering and information technologies, http://www.cssd-udjg.ugal.ro/index.php/programme-	SCIENTIFIC CONFERENCE OF DOCTORAL SCHOOLS Programmes SCDS – UDJG 2022, 10th Edition of SCDS-UDJG, 9th and 10th of June 2022,	9-10 June, Galati, Romania	Doctoral Schools SCDS-UDJG

	2022			
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Tabel 7.1.7.

Brevete de invenție (solicitare / acordate)

Nr.crt.	Nr.cerere de brevet/ H.G. Brevet acordat	Titlu brevet	Autori
1	CBI A00512 din 25.08.2022	„Unificarea implementării și testării algoritmilor de control a filtrelor active de putere trifazate, de joasă tensiune, de tip paralel, în stand experimental și în prototipuri filtre active de putere” -	GĂICEANU Marian, EPURE Silviu-Ionuț, SOLEA Răzvan-Constantin , BUHOSU Răzvan

7.1.8. b Citari ISI

1. [Multivariable feedback linearizing control of Chlamydomonas reinhardtii photoautotrophic...](#) citat în:

A. [Fictitious Reference Iterative Tuning Control of the pH in a Photobioreactor](#)

[G Ifrim](#), [G Horincar](#), [L Condrachi](#)... - ... on System Theory ..., 2022 - [ieeexplore.ieee.org](#)

B. [A hybrid asymptotic-Kalman observer for estimation of microalgae growth in a closed photobioreactor](#)

[JPA Restrepo](#), [M Titica](#)... - 2022 10th International ..., 2022 - [ieeexplore.ieee.org](#)

2. [On the evaluation of the global impact of control strategies applied to wastewater treatment plants](#) citat în:

[Complementary Control Actions for Greenhouse Gas Emissions Reduction in Wastewater Treatment Plant Operation](#)

[I Santin](#), [R Vilanova](#), [C Pedret](#)... - ... on System Theory ..., 2022 - [ieeexplore.ieee.org](#)

3. [Fuzzy logic for plant-wide control of biological wastewater treatment process including greenhous.](#) citat în:

[Complementary Control Actions for Greenhouse Gas Emissions Reduction in Wastewater Treatment Plant Operation](#)

[I Santin](#), [R Vilanova](#), [C Pedret](#)... - ... on System Theory ..., 2022 - [ieeexplore.ieee.org](#)

4. [Control strategies for nitrous oxide emissions reduction on wastewater treatment plants operation](#) citat în:

[Control strategies for nitrous oxide emissions reduction on wastewater treatment plants operation](#) citat în:

[Complementary Control Actions for Greenhouse Gas Emissions Reduction in Wastewater Treatment Plant Operation](#)

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Tabel 7.1.9.

Produse/servicii/tehnologii rezultate din activități de cercetare, bazate pe brevete, omologări sau inovații proprii

Nr. crt.	Denumire produs/ serviciu/ tehnologie
1	The design of the intelligent control structures based on advanced techniques (backstepping, sliding mode control and others) for Autonomous Complex Systems for Personal Robotic Assistant and Multidirectional Autonomous Vehicle.
2	The design of the robot's navigation hierarchical control structures based on ultrasonic and laser sensors designated to serve medical-social technologies and flexible production/assembly lines either in the laboratory or in industrial environment.
3	The design of the navigation control structure based on laser sensors and video-biometric system for an Autonomous Complex System with an Wheeled Chair integrated in personal assistance technologies for elderly and people with severe neuromotor disabilities.
4	Testing of the Autonomous Complex Systems used in personal assistance technologies
5	The design of the mobile video-servoing systems for the manipulators.

Tabel 7.1.10.

Tabel 7.2

Teze de doctorat finalizate și în derulare

Nr.crt.	Titlul tezei de doctorat	Finalizat/ în derulare	Domeniul de doctorat	Numele și prenumele doctorandului+	Numele și prenumele conducătorului de doctorat
1.	Contribuții privind conducerea automată a proceselor de digestie anaerobă	Finalizat cu diploma de doctor conform OME nr 4758/22.02.2022	Ingineria Sistemelor	Larisa DIACONU	Prof.hab.dr.ing. Marian BARBU
2.	Contribuții privind modelarea și conducerea automată a proceselor de tratare a apelor uzate	în derulare	Ingineria Sistemelor	Bogdan ROSU	Prof.hab.dr.ing. Marian BARBU

3.	Conducerea automata avansata a proceselor complexe	în derulare	Ingineria Sistemelor	Liliana Ghinea	Prof.hab.dr.ing. Marian BARBU
4	<i>Contribuții privind modelarea și conducerea automată a bioproceselor</i>	în derulare	Ingineria Sistemelor	Ira Adeline Simionov	Prof.hab.dr.ing. Marian BARBU
5	Modelarea și conducerea tehnologiilor de fabricație pe linii de mecatronică multifuncționale cu sisteme robotice integrate	în derulare	Ingineria Sistemelor	Dan IONESCU	Prof.dr.ing. Adrian FILIPESCU
6	Contributii la integrarea sistemelor servoing vizuale in linii de fabricație flexibila de precizie asistate de sisteme robotice autonome	în derulare	Ingineria Sistemelor	Georgian SIMION	Prof.dr.ing. Adrian FILIPESCU
7	Optimal control of an integrating system consisting of a sewer network and a wastewater treatment plant	în derulare teza in cotutela cu Dept. de Telecomunicació i Enginyeria de Sistemes Escola d'Enginyeria, Univesitat Autonoma Barcelona	Ingineria Sistemelor	Iulian VASILIEV	Prof.dr.ing . Sergiu CARAMAN