PERSONAL INFORMATION

Anna Lekova

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Replace with type of IM service Replace with messaging account(s)

Sex FEMALE | Date of birth 08.12.1965 | Nationality Bulgarian

https://orcid.org/0000-0002-9012-4714

WORK EXPERIENCE

From 01.03.2017 till now	Institute of Robotics (IR) BAS Professor, Head of "Interactive Robotics and Control Systems" Department
01.11.2010– 30.02.2017	Institute of System Engineering and Robotics (ISER) BAS Assoc. Prof. Head of "Hybrid Systems" Department
01.11.1992– 30.06.2010 *03.09.1988- 30.06.1989*	Institute of Control and System Research at the Bulgarian Academy of Sciences Central Institute of Computing

EDUCATION AND TRAINING

2008-2013.	Erasmus teacher in "Wireless mobile networks, intelligent routing protocols and security" - University of Portsmouth, UK
1990-1992	Visiting Assistant Professor of "Programming and Computing Systems" at the Technical University - Sofia, Faculty of Computing
01.10.1989.– 30.09.1992	Technical University - Sofia, Faculty of Computing PhD student in the scientific field "Application of principles approach and methods of cybernetics in various fields of science"
07.08.1995	PhD Dissertation on "Intelligent design methods of machine parts by characteristics of CAD / CAM systems based on production rules"
15.09.1980г .– 30.06.1983г	Math School Sofia

Projects

2023-2025	ATlog: Innovative methodology for integration of assistive technologies in speech therapy for children and adolescents, National Scientific Fund, Contract № КП-06-Н67/1
2019-2024	Project for Competence Center "Intelligent Mechatronic, Eco and Energy Saving Systems and Technologies" № BG05M2OP001-1.002-0023
2020-2024	EU COST Action № 19104 - advancing Social inclusion through Technology and EmPowerment
2018-2022	CybSPEED: Cyber-Physical Systems for PEdagogical Rehabilitation in Special EDucation, Proposal Number 777720 , MSCA-RISE-2017
2018-2019	RONNI: Increasing the wellbeing of the population by RObotic and ICT based iNNovative educatIon. Project DSPF, Interreg, EU Strategy for the Danube Region
2018-2021	“Research and Modeling of new robots through non-traditional technologies and materials - National Scientific Fund, Contract № ДН 17/10 NSF
2016-2018	"Robo-Academy" in the frame of Student Institute of Bulgarian Academy of Sciences for learning by explorations - "To Introduce Modern Methods in Education and Working with Young Talents" MES,
2014-2018	Decree of the Council of Ministers - №347, т.5 с), dated 08.12.2016
2015-2016	EU COST Action № TD1309 „Play for Children with Disabilities (LUDI)”, WP2 Technologies for structured and unstructured play
2007-2010	Project N Д03-90/27.05.2015 Methodologies and technologies for enhancing the motor and social skills of children with developmental problems -BG09 PROGRAMME, EEA SCHOLARSHIPS FUND PROJECTS FOR INTERINSTITUTIONAL COOPERATION MEASURE (Project Coordinator)
2006-2010	European Project (FP7) “Innovative Dual mEmbrAne fueL Cell (IDEALCell)” “European Internet Centre for Impedance Spectroscopy
2003-2005	Ad-Hoc InfoWare (Middleware Services for Information Sharing in Ad-Hoc Networks)in the context of NFRs IKT
2003-2004	European Project (FP5) “Tools for sustainability: Development and application of an integrated framework”, EESD Program
1993-1997	UNESCO –Contract No UVO- ROSTE 875.575.2,
1998-2001	"Dynamic allocation of resources in information systems with hybrid intelligence" -A contract № 216/92 NSF
	"Adaptability of human-computer interface" - Contract № 809/98 NSF

CPECIALIZATIONS

- 1998 - one month specialization at the University of Wuppertal, Germany - Image processing and fuzzy logic.
- 2001 - three-month specialization at the Free University of Brussels, Belgium - Web design.
- 2010 - one-month DFG specialization at University of Bonn, Germany - Improvement of multicast wireless network routing protocols for realistic scenarios.
- 2015-2016 Specialization at the University of Oslo, Norway - Middleware Technologies in Multi-Hop Wireless Networks
- 2018 - two-month specialization at Kyutech Institute of Technology, Japan - Mathematical basement of the signal processing for Brain-Computer Interface (BCI) Japan
- 2019 - one-month specialization at the University of Grenoble, G-SCOP laboratory, virtual reality for rehabilitation
- 2018 – Greece, training on Puppets, Social Robots in the Theater, Cognitive Modeling, Pedagogical Rehabilitation and Robot Therapy in the frame of CybSPEED EU project
- 2019 – Greece, training on "Social Robot Modeling for Pedagogical Rehabilitation Practical Implementation Issues" in the frame of CybSPEED EU project

- Participant in more than 5 Erasmus Mobility Contracts.
- 2013-2018 Representative of BULGARIA in COST Action TD1309 - "Play for children with disabilities" (LUDI)
- 2020-2024 Representative of BULGARIA in COST Action CA19104 - "Advancing social inclusion through technology"(a-STEP)

PERSONAL SKILLS

Mother tongue(s): Bulgarian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	excellent	excellent	excellent	excellent	excellent
	Replace with name of language certificate. Enter level if known.				
Russian	excellent	excellent	excellent	excellent	excellent
	Replace with name of language certificate. Enter level if known.				

Communication skills

• good communication skills;
▪ Ability to work in team with specialists from our various areas

Organisational / managerial skills

▪ excellent leadership skills
▪ very good organizational skills

Job-related skills

▪ Head of the Section " Interactive Robotics and Control Systems", a participant in several international projects of the EU and the tutor of an ongoing international project in the EEA

Professional experience

Professional field 4.6 "Informatics and Computer Science"

▪ Neurocomputing, EEG tracking and processing, Brain-Computer Interfaces, Brain-Robot Interfaces;

▪ Interactive Robotics, Socially Assistive Robots, Humanoid robots and Virtual/Mixed Reality for special needs education and rehabilitation, Human-robot interactions, Conversational AI in robots, Ethical and legal aspects of the use of robotic systems with AI;

▪ Internet of Things, Internet of Everything;

▪ Machine Learning Technologies, Image processing and pattern recognition, AI Object Detection;

▪ Wireless mobile networks and intelligent protocols for routing and security;

▪ Soft computing, fuzzy logic, clustering, evolving self-learning algorithms, NLP.

, Interactive Robotics, Internet of Things, Fuzzy Logic Control, , Cloud Technologies, Natural Language Recognition and Processing, , Brain-Machine Interfaces, EEG Time Series Analysis,

Driving licence

category
▪ B

MEMBERSHIPS

- Member of the reviewers of MDPI Robotics (Q1) https://www.mdpi.com/journal/robotics/submission_reviewers
- Member of the reviewers of EGNOS Data Access Service (EDAS), since 2002.
- Member of the reviewers of Frontiers: Robotics and AI, 2020 - 2022
- Member of ACM (Association for Computing Machinery) since 2022
- Member of AcademiaNet: Profiles of Leading Women Scientists

AWARDS

ISAO 2022 International Scientist Awards on Engineering, Science and Medicine for "Outstanding Scientist Award".
IEEE Certificate for best paper (2013)
ACM Certificate for best paper (2015, 2022)
Reviewer Certificate award from Expert System (Wiley Online Library)- 2019

Selected Publications (last 5 years)

1. Tanev T., Lekova A. "*Implementation of Actors' Emotional Talent into Social Robots through Capture of Human Head's Motion and Basic Expression"* Springer Int. Journal of Social Robotics, 2022. https://doi.org/10.1007/s12369-022-00910-0 **Q1 IF 3.802 SJR 1.11**
2. Lekova A., Andreeva A., Simonska M., Tanev T., Kostova S. A system for speech and language therapy with a potential to work in the IoT, CompSysTech'22: pp. 119–124, 2022. http://dx.doi.org/10.1145/3546118.3546147 **SJR(Scopus) 0.232**
3. Lekova A., P. Tsvetkova, T. Tanev, P. Mitrouchev, and S. Kostova, "Making humanoid robots teaching assistants by using natural language processing (NLP) cloud-based services," Journal of Mechatronics and Artificial Intelligence in Engineering, Vol. 3, No. 1, pp. 30–39, Jun. 2022, https://doi.org/10.21595/jmai.2022.22720
4. Andreeva, A., A. Lekova, Simonska, M., Tanev, T. (2022). Parents' Evaluation of Interaction between Robots and Children with Neurodevelopmental Disorders. In: Uskov, V.L., Howlett, R.J., Jain, L.C. (eds) Smart Education and e-Learning - Smart Pedagogy. SEEL-22 2022. Smart Innovation, Systems and Technologies, vol 305. Springer. https://doi.org/10.1007/978-981-19-3112-3_45 **SJR(Scopus) 0.224 Q3**
5. S. E. Kremenski and A. K. Lekova, "Brain-robot Communications in the Internet of Things," 2022 International Conference on Information Technologies (InfoTech), 2022, pp. 1-6, doi: 10.1109/InfoTech55606.2022.9897117 **SJR_{2020}=0,147**
6. A. G. Kremenska, A. K. Lekova and G. P. Dimitrov, "EEG Brain-Computer Interfaces for Internet of Everything (IoE)," 2022 International Conference on Information Technologies (InfoTech), 2022, pp. 1-6, doi: 10.1109/InfoTech55606.2022.9897097. **SJR_{2020}=0,147**
7. J. Wang, P. Mitrouchev, S. Kostova, T. Tanev, A. Lekova et al. "Augmented Reality Environment for Sensory input in the context of different illusions", MIT 2022 Conference, Piran Slovenia, September 2022, Sep 2022, Piran, Slovenia
8. Lekova A., Chavdarov I. "A Fuzzy Shell for Developing an Interpretable BCI Based on the Spatiotemporal Dynamics of the Evoked Oscillations," Computational Intelligence and Neuroscience, vol. 2021, Article ID 6685672, 21 pages, 2021. https://doi.org/10.1155/2021/6685672. **SJR (Scopus):0.605, Q1 IF (Web of Science):3.12**
9. V. Kaburlasos, C. Lytridis, E. Vrochidou, C. Bazinas, G.Papakostas, A. Lekova, O. Bouattane, M. Youssfi and T. Hashimoto. Granule-based-Classifier (GbC): A Lattice Computing Scheme Applied on Tree Data". Mathematics Journal from MDPI, Vol.9, Issue 22, 2021. https://doi.org/10.3390/math9222889 **Q1 IF 2.592**
10. J. Górriz, Ramírez, J.... A. Lekova,., et al. Artificial intelligence within the interplay between natural and

artificial computation: Advances in data science, trends and applications. Neurocomputing, 410, Elsevier, 2020, DOI:doi.org/10.1016/j.neucom.2020.05.078, 237-270. SJR (Scopus):1.18, https://doi.org/10.1016/j.neucom.2020.05.078 **Q1, JCR-IF (Web of Science):4.438.**

11. R. van den Heuvela, R. Jansensa, B. Littler, Huijnen, C., Di Nuovo, A., Bonarini, A., Desideri, L., Encarnação, P., A. Lekova, De Witte, L. "The Potential of Robotics for the Development and Wellbeing of Children with Disabilities as We See It, Technology and Disability, "34 (1), 25-33, 2022. **Q3,** https://doi.org/10.3233/TAD-210346
12. Kostova, S. A. Lekova, T. Tanev, A. Andreeva, M. Simonska and P. Mitrouchev, Cyber-Physical System for language therapy for children with communication disorders, pp. 239. Proceedings of the Basque Conference on Cyber-Physical Systems and Artificial Intelligence May 18-19, 2022 Palacio Miramar, San Sebastian, Spain, Editor: Manuel Graña, https://doi.org/10.5281/zenodo.6562355
13. Wang, J., Peter Mitrouchev, Julia Dvorak, Amélie Svensson, Snezhana, Kostova, Tanio Tanev, Anna Lekova, Tsvete Yaneva, Violina Markova, Maya Dimitrova, Roman Zahariev, Nina Vlachkova and Franck Quaine. Sensory input and its treatment in the context of different illusions. Application for size-weight perception pp. 247. Proceedings of the Basque Conference on Cyber-Physical Systems and Artificial Intelligence May 18-19, 2022 Palacio Miramar, San Sebastian, Spain, Editor: Manuel Graña, https://doi.org/10.5281/zenodo.6562355
14. Lekova A., P. Tsvetkova, T. Tanev. Robot-assisted psychosocial techniques for language learning by hearing-impaired children. International Journal on Information Technologies and Security (IJITS). Special Issue SP3, vol. 13, 2021. **SJR (Scopus):0.15 Q4**
15. Lekova A., P. Tsvetkova. "Toward Robot-Assisted Psychosocial Techniques for Sound Stimulation of Children Born with Hearing Loss," 2021 International Conference on Information Technologies (InfoTech), 2021, pp. 1-4. https://doi.org/ 10.1109/InfoTech52438.2021.9548417 **SJR_{2020}=0,147**
16. Lekova A., T. Tanev, S. Kostova, V. Kaburlasos. Lightweight framework for interconnecting virtual and real things via Node-RED. Industry-4.0 V Int. Conference, 1, Scientific Technical Union of Mechanical Engineering "Industry-4.0", 2020
17. Lytridis, C, A. Lekova, Bazinas, C, Manios, M, Kaburlasos, V.G. WINkNN: Windowed Intervals' Number kNN Classifier for Efficient Time-Series Applications. Mathematics, 6, 3, MDPI AG, 2020, DOI:10.3390/math8030413,. https://doi.org/10.3390/math8030413 **SJR (Scopus):0.538**
18. Lekova A., I. Chavdarov, B. Naydenov, A. Krastev, S. Kostova, (2019) "Brain-inspired IoT Controlled Walking Robot Big-Foot", Advances in Science, Technology and Engineering Systems Journal, vol. 4, no. 3, pp. 220-226, 2019. https://doi.org/10.25046/aj040329 **SJR (Scopus):0.188**
19. M. Touil, L. Bahatti, A. Elmagri, A. Lekova. EEG signal cleaning for drowsiness detection. 2020 International Conference on Electrical and Information Technologies, ICEIT 2020, Article number 91131, 2020, https://doi.org/10.1109/ICEIT48248.2020.9113175 **(Scopus)**
20. L. Bahatti, A. El Magri, A. Lekova, O.Bouattane. Developing Brain Computer Interface for Motor Imagery Mental Commands. Complex Control Systems, 2, 1, 2020, ISSN:2603-4697 (Online), 1-6
21. Dimitrova, M., Kostova, S., Lekova, A., Vrochidou, E., Chavdarov, I., Krastev, A., Botsova, R., Andreeva, A., Stancheva-Popkostadinova, V., Ozaeta, L.. Cyber-Physical Systems for Pedagogical Rehabilitation from an Inclusive Education Perspective. BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 11, 2Sup1, LUMEN Publishing, 2020, ISSN:2068-0473, https://doi.org/10.18662/brain/11.2Sup1/104, 186-207
22. Lekova A., T. Tanev, V. Vassileva-Aleksandrova, S. Kostova, P. Dachkinov, O. Bouattane (2019).. Social Robots for Reinforcing Attention and Forming Emotional Knowledge of Children With Special Educational Needs. Spec. Issue of "LEarning Disabilities and ICT Support" of the International Journal of Information Science and Technology, Volume 3, N°6, 2019, ISSN : 2550-5114 http://dx.doi.org/10.57675/IMIST.PRSM/ijist-v3i6.119
23. Lekova, A., M. Dimitrova, S. Kostova, O. Bouattane and L. Ozaeta, "BCI for Assessing the Emotional and

Cognitive Skills of Children with Special Educational Needs," 2018 IEEE 5th International Congress on Information Science and Technology (CiSt), Marrakech, Morocco, 2018, pp. 400-403. https://doi.org/10.1109/CIST.2018.8596571 **(Scopus)**

24. Dachkinov P., Tanev T. K., A. Lekova, Batbaatar D., Wagatsuma H.. Design and Motion Capabilities of an Emotion-Expressive Robot EmoSan. Joint 10th International Conference on Soft Computing and Intelligent Systems and 19th International Symposium on Advanced Intelligent Systems SCIS&ISIS2018,Toyama, Japan, 5-8 December, 2018, https://doi.org/10.1109/SCIS-ISIS.2018.00207, 1332-1338 **(Scopus)**
25. T Bhattacharjee, R Kar, A Konar, A. Lekova and A. Nagar, "A General Type-2 Fuzzy Set Induced Single Trial P300 Detection", IEEE International Conference on Fuzzy Systems (FuzzIEEE'17), Naples, 9-12 July 2017, ISSN: 1558-4739, https://doi.org/10.1109/FUZZ-IEEE.2017.8015660 **SJR (Scopus):0.352**
26. S Saha, R Lahiri, A Konar, A. Lekova and A. Nagar "A Novel Approach to TSK Model Based Gesture Driven Robot Movement", IEEE International Conference on Fuzzy Systems (FuzzIEEE'17), Naples, 9-12 July 2017, ISSN: 1558-4739, https://doi.org/10.1109/FUZZ-IEEE.2017.8015739 **SJR (Scopus):0.352**
27. Lekova A, V. Stancheva A. Krastev, M. Dimitrova and H. Wagatsuma, (2015): Redesign of Computer Games towards Serious Motion-Sensing Games for Children with Limited Physical Skills: A Developer Perspective, Springer Advances in Intelligent Systems and Computing, S. Loshkovska, S. Koceski (Editors): 7th ICT ACT Innovations 2015, Web Proceedings, ISSN 1857-7288, pp 224-233
28. Das, P. Sadhu, A.K, Konar, A, Lekova, (2015): A. Type 2 Fuzzy Induced Person Identification Using Kinect Sensor, IEEE International Conference on Fuzzy Systems (FuzzIEEE'15), Istanbul 2-5 August 2015, pp 1-8. ISSN: 1544-5615; ISBN: 978-1-4673-7428-6
29. Ch. Saha, D. Goswami, S. Saha, A. Konar, A. Lekova and A. Nagarz, (2015): A Novel Gesture Driven Fuzzy Interface System For Car Racing Game, IEEE International Conference on Fuzzy Systems (FuzzIEEE'15), Istanbul 2-5 August 2015, pp 1-8. ISSN: 1544-5615 ISBN: 978-1-4673-7428-6
30. Kostova S., I. Chavdarov, A. Lekova, M. Dimitrova and A. Krastev. Acquiring Digital Skills and New Qualifications by Introducing Modern Technologies in Education. Complex Control Systems, ISSN 2603-4697 (Online). Vol. 2, No 1, 2020, 7-13
31. Lekova A. (2011): Data-Driven Fuzzy Modeling for Wireless Ad-hoc Networks, ISBN:978-3-8443-2391-7, LAMBERT Academic Publishing GmbH&Co. KG, Saarbrucken, Germany, 96 pages.
32. Lekova, A., Krastev, A. & Chavdarov, I. (2018). Wireless Kinect-NAO Framework Based on Takagi-Sugeno Fuzzy Inference System. Information Technologies and Control, 15(2), pp. 14-24. Oct. 2018, https://doi.org/10.1515/itc-2017-0023
33. Chavdarov, I., B. Najdenov, S. Kostova, A. Krastev and A. Lekova. "Development and Applications of a 3D Printed Walking Robot - Big-Foot". 2018 26th International Conference on Software, Telecommunications and Computer Networks (SoftCOM), Split, 2018, pp. 1-5. https://doi.org/10.23919/SOFTCOM.2018.8555843
34. Lekova A, D. Ryan, R. Davidrajuh, Fingers and Gesture Recognition with Kinect v2 Sensor, Information Technologies and Control, DE GRUYTER OPEN , 2016 , 24-30, ISSN 1312-2622 https://doi.org/10.1515/itc-2017-0009
35. Dimitrova, M., Lekova, A., Kostova, S., Roumenin, C., Cherneva, M., Krastev, A. and Chavdarov, I. (2016) A Multi-Domain Approach to Design of CPS in Special Education: Issues of Evaluation and Adaptation, Proceedings of the 5th Workshop of the MPM4CPS COST Action, 24-25 November, 2016, Malaga, Spain, 196-205
36. Lekova, A., Mo Adda (2015): "Hand Gesture Recognition Based On Signals Cross-Correlation", Recent Trends in Hand Gesture Recognition, Editor: A. Chaudhary, Science Gate Publishing, Vol. 3, 2015, 43-74.
37. Lekova A., (2014): "Evolving fuzzy modeling based on low-complexity constrained fuzzy clustering",

Comptes rendus de l'Académie bulgare des Sciences, Tome 67, No 10, 2014, 1411-1418, ISSN: 1310-1331, IF=0.284.

38. Botsova, R., Lekova, A., & Chavdarov, I. (2015). Imitation learning of robots by integrating Microsoft Kinect and PID controller with a sensor for angular displacement in a robot joint. In ACM Proceedings of the 16th International Conference on Computer Systems and Technologies, pp. 268-275, ISBN: 978-1-4503-3357-3. (best paper award) https://doi.org/
39. Krastev, A., A. Lekova, I. Chavdarov, M. Dimitrova (2014): "An Interactive Technology to Support Education Of Children With Hearing Problems", ACM Intern. Conf. on Computer Systems and Technol., Compsystech'14, Vol. 883, June, Ruse, Bulgaria, 2014, 445-451, ISBN: 9781-450-3024-3-2
40. Lekova A., (2014): "Evolving fuzzy modeling based on low-complexity constrained fuzzy clustering", Comptes rendus de l'Académie bulgare des Sciences, Tome 67, No 10, 2014, 1411-1418, ISSN: 1310-1331, IF=0.284.
41. Lekova A, M Dimitrova, (2013): Hand Gestures Recognition Based on Lightweight Evolving Fuzzy Clustering Method, IEEE Second International Conference on Image Information Processing – ICIIP India, 9-11.Dec. 2013, 505-510, ISBN: 978-1-4673-6099-9 (best paper award)