PERSONAL INFORMATION

Anna Lekova

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Sex FEMALE | Date of birth 08.12.1965 | Nationality Bulgarian

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
2018-2023	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, Decree of the Council of Ministers - №347, т.5 с), dated 08.12.2016
2014-2018	EU COST Action № TD1309 „Play for Children with Disabilities (LUDI)”, WP2 Technologies for structured and unstructured play
2015-2016	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)
2007-2010	European Project (FP7) “Innovative Dual mEmbrAne fueL Cell (IDEALCell)” “European Internet Centre for Impedance Spectroscopy
2006-2010	Ad-Hoc InfoWare (Middleware Services for Information Sharing in Ad-Hoc Networks)in the context of NFRs IKT
2003-2005	European Project (FP5) “Tools for sustainability: Development and application of an integrated framework”, EESD Program
2003-2004	UNESCO –Contract No UVO- ROSTE 875.575.2,
1993-1997	"Dynamic allocation of resources in information systems with hybrid intelligence" -№ 216/92 NSF
1998-2001	"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"
Professional field 5.2 "Electrical Engineering, Electronics and Automation"

▪ 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;

▪ LLM, text-generative AI, NLP;

▪ 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.

Driving licence

category
▪ B

MEMBERSHIPS

- Frontiers: Robotics and AI>Computational Intelligence in Robotics, editor since 2023
  https://loop.frontiersin.org/people/578726
- Member of the reviewers of MDPI Robotics
  https://www.mdpi.com/journal/robotics/submission_reviewers
- Member of the reviewers of Frontiers in Robotics and AI
  https://www.frontiersin.org/journals/robotics-and-ai/editors
- 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. Lekova A, Tsvetkova P, Andreeva A, Dimitrov G, Tanev T, Simonska M, Stefanov T, Stancheva-Popkostadinova V, Padareva G, Rasheva K, et al. A Design-Based Research Approach to Streamline the Integration of High-Tech Assistive Technologies in Speech and Language Therapy. Technologies. 2025; 13(7):306. https://doi.org/10.3390/technologies13070306
2. Lekova A., P Tsvetkova, A Andreeva, G Padareva, M Simonska, A Zelnichka, T Stefanov. Preliminary Evidence of Spontaneous Speech and Emotional Expression in Children During Play-Based 360° Virtual Tours in Speech and Language Interventions. International Conference on Educational Technology and Computers (ICETC) 2025 (in print)
3. Rasheva-Yordanova K., I. Kostadinova, G. Georgieva-Tsaneva, A. Andreeva, P. Tsvetkova, A. Lekova, et al. A Comprehensive Review and Analysis of Virtual Reality Scenarios in Speech and Language Therapy. TEM Journal, 14(2), pp. 1895-1907, 2025.
4. Andreeva A., G Padareva, M Simonska, A. Lekova. Assessment Of Speech And Language Therapy Assisted With Social Robots And Virtual Reality: Phonetic And Linguistic Analysis Of Speech Technology for Inclusion and Participation for All: Recent Achievements and Future Directions - 8th Int. Conf., AAATE, 2025 (in print)
5. Kremenska, A., Lekova, A., Kremenski, S., & Dimitrov, G. (2025). Validating the openBCI Nodes through EEG-based BCI Application for Smart Home Automation Control. Journal of Communications Software and Systems, 21(3), 250-261.
6. Kaur G, Kostova B, Tsvetkova P, Lekova A. Methodology and Experimental Protocol for Fatigue Analysis in Suggestopedia Teachers. Brain Sciences. 2024; 14(12):1215. https://doi.org/10.3390/brainsci14121215, Scopus -Q2 JIF_{2023} = 2.7
7. Lekova A, P. Tsvetkova, M. Mitevska and T. Medneva, "Furhat PsychScreen Framework: Streamlining Robot-Assisted Psychological Screening Implementation," 2024 International Conference on Software, Telecommunications and Computer Networks (SoftCOM), Split, Croatia, 2024, pp. 1-6, doi: 10.23919/SoftCOM62040.2024.10721865.
8. Lekova, A. K., Tsvetkova, P., & Andreeva, A. (2024). Enhancing Brain Health and Cognitive Development Through Sensorimotor Play in Virtual Reality: Uncovering the Neural Correlates. The International Journal of Games and Social Impact, 2(1), 46-70.

9. Kremenska A, A. Lekova and G. Dimitrov, "Validating the OpenBCI Nodes within the Node-RED Library through an EEG-based BCI Application for IoT," 2024 International Conference on Software, Telecommunications and Computer Networks (SoftCOM), Split, Croatia, 2024, pp. 1-6, doi: 10.23919/SoftCOM62040.2024.10721977.
10. Andreeva, A., Lekova, A., Tsvetkova, P., Simonska, M. Expanding the Capabilities of Robot NAO to Enable Human-Like Communication with Children with Speech and Language Disorder. Proceeding of 25th International Conference on Computer Systems and Technologies CompSysTech'24, 2024. https://doi.org/10.1145/3674912.3674919.
11. Kostova, S., Lekova, A.. Social Humanoid Robots as Assistive Technology for individuals with ASD-assessment of good practices. Proceedings of the International Conference on Computer Systems and Technologies 2024., ACM International Conference Proceeding Series, 2024, 69-75. https://doi.org/10.1145/3674912.3674920
12. Kremenska, A., & Lekova, A. (2024). New Nodes for Node‐RED Library within OpenBCI Category for EEG‐Based Brain‐Machine Interface Design and Integration in IoT. MDPI Preprints. https://doi.org/10.20944/preprints202401.1608.v1
13. Lekova A., P. Tsvetkova, A. Andreeva, M. Simonska, A. Kremenska. System Software Architecture for Advancing Human-Robot Interaction by Cloud Services and Multi-Robot Cooperation. International Journal on Information Technologies and Security (IJITS), vol.16, no.1, pp. 65-76, 2024. https://doi.org/10.59035/FMFZ4017
14. Lekova A., Vitanova D., Design based-research for streamlining the integration of text-generative AI into socially-assistive robots, 2024 International Conference "ROBOTICS & MEHATRONICS", 29 – 30 October, 2024, Sofia, Bulgaria.
15. S. Kostova, A. Lekova and P. Tsvetkova. The impact of assistive technologies in educational settings for individuals with neurodevelopmental disorders: a national pilot study. InPACT conference, 2024. ISBN: 978-989-35106-6-7, pp. 572-576.
16. Georgieva-Tsaneva G, Andreeva A, Tsvetkova P, Lekova A, Simonska M, Stancheva-Popkostadinova V, Dimitrov G, Rasheva-Yordanova K, Kostadinova I. Exploring the Potential of Social Robots for Speech and Language Therapy: A Review and Analysis of Interactive Scenarios. Machines. 2023; 11(7):693. https://doi.org/10.3390/machines11070693
17. Alboul, L., Dimitrova, M., Lekova, A., Kaburlasos, V. G., & Mitrouchev, P. Emerging Technologies for Assistive Robotics: Current Challenges and Perspectives. Frontiers in Robotics and AI, 10, 1288360, https://doi.org/10.3389/frobt.2023.1288360.
18. Georgieva-Tsaneva, G.; Andreeva, A.; Tsvetkova, P.; Lekova, A.; Simonska, M.; Stancheva-Popkostadinova, V.; Dimitrov, G.; Rasheva-Yordanova, K.; Kostadinova, I. Social Robots for the Therapy of Communication Disorders. Encyclopedia. Available online: https://encyclopedia.pub/entry/46532
19. Lekova A., P. Tsvetkova and A. Andreeva, "System Software Architecture for Enhancing Human-robot Interaction by Conversational AI," 2023 International Conference on Information Technologies (InfoTech), Varna, Bulgaria, 2023, pp. 1-6, doi: 10.1109/InfoTech58664.2023.10266870
20. Tanev T., Dachkinov P., Valayil T., Dimitrova M., Kostova S., Lekova A., Implementation of robotic and assistive technology in the patient-centered physical rehabilitation, Journal of the Technical University of Gabrovo N 66, 2023, pp. 11-15
21. 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
22. 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, ACM CompSysTech'22: pp. 119–124, 2022.

http://dx.doi.org/10.1145/3546118.3546147
23. 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
24. 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
25. S. E. Kremenski and A. K. Lekova, "Brain-robot Communications in the Internet of Things," 2022 IEEE International Conference on Information Technologies (InfoTech), 2022, pp. 1-6, doi: 10.1109/InfoTech55606.2022.9897117
26. A. G. Kremenska, A. K. Lekova and G. P. Dimitrov, "EEG Brain-Computer Interfaces for Internet of Everything (IoE)," 2022 IEEE International Conference on Information Technologies (InfoTech), 2022, pp. 1-6, doi: 10.1109/InfoTech55606.2022.9897097
27. 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
28. 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.
29. 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
30. 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
31. 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. https://doi.org/10.3233/TAD-210346
32. 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
33. 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.
34. 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. doi: 10.1109/InfoTech52438.2021.9548417
35. 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
36. 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

37. 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