Curriculum Vitae

Name	Aleksei Tepljakov
Date of Birth	June 2, 1987 (Tallinn)
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Work Experience / Job Title

2016 – ...	Tallinn University of Technology, Faculty of Information Technology, Department of Computer Control, Control Systems Research Laboratory / Research Scientist
2011 – 2015	Tallinn University of Technology, Faculty of Information Technology, Department of Computer Control, Control Systems Research Laboratory / Engineer
2009 – ...	Electronics Developer / Freelance (Schematics and PCB Design, Software Development)
2005 – 2008	Metalworking plant / Engineer (Machining)
2003 – ...	Web Development / Designer and Coder

Degree Information

21.08.2015	**Doctor of Philosophy in Informatics and System Engineering**, thesis topic: "Fractional-order Modeling and Control of Dynamic Systems"; Tallinn University of Technology, Faculty of Information Technology, Department of Computer Control

14.06.2011	**Master of Science in Engineering**, thesis topic: "Fractional-order Calculus based Identification and Control of Linear Dynamic Systems"; Tallinn University of Technology, Faculty of Information Technology, Department of Computer Control

Research

2015 – ...	Industry 4.0: Advancing industrial applications beyond the state-of-the-art through the design of intelligent (control) systems
2014 – ...	Virtual and Augmented Reality applications. Modeling and visualization methods for immersive virtual environments.
2010 – ...	Application of fractional-order calculus in system modeling, identification and control. Research and development of fractional-order mathematical models.

Administrative Responsibilities

2017 – ...	Head of Re:creation Virtual and Augmented Reality Laboratory, Mektory Business and Innovation Centre, Tallinn University of Technology
2015 – 2016	IEEE Student Branch at Tallinn University of Technology / Chair
2014 – 2015	IEEE Student Branch at Tallinn University of Technology / Vice Chair

Awards and Honors

2013	American Control Conference 2013: Best Presentation Award in the 'PID Control' session

Education

2011 – 2015	Tallinn University of Technology, Faculty of Information Technology: Information and Communication Technology, Doctor of Philosophy
2009 – 2011	Tallinn University of Technology, Faculty of Information Technology, Master of Science in Engineering, CUM LAUDE
2006 – 2009	Tallinn University of Technology, Faculty of Information Technology, Bachelor of Science
1994 – 2006	Ehte high school

IEEE Membership and Activities Brief

Dr. Aleksei Tepljakov is a member of IEEE since 2011 and a member of Control Systems Society since 2012. As a Graduate Student member he co-founded the IEEE Student Branch at Tallinn University of Technology in 2014 where he initially served as Vice-chair and then served as Chair until January 2017. Under the Student Branch banner he helped organize several activities, including company visits and Distinguished Lecture events. He was also responsible for preparing print materials covering the activities of the Estonian Section, which included the design of new IEEE Estonia Section roll-up banners and flyers for distribution on a locally organized conference technically co-sponsored by IEEE. From January 2018 he will assume the duties of IEEE Estonia Section Webmaster.

Publications

Books

[1] A. Tepljakov, *Fractional-order Modeling and Control of Dynamic Systems*. Springer International Publishing, 2017.

Journal

[1] A. Tepljakov, B. B. Alagoz, E. Gonzalez, E. Petlenkov, and C. Yeroglu, "Model reference adaptive control scheme for retuning method based fractional-order PID control with disturbance rejection applied to closed-loop control

of a magnetic levitation system," *Journal of Circuits, Systems and Computers*, vol. 27, no. 11, 2018, accepted for publication.

[2] A. Tepljakov, E. Petlenkov, E. Gonzalez, and J. Belikov, "Digital realization of retuning fractional-order controllers for an existing closed-loop control system," *Journal of Circuits, Systems and Computers*, vol. 26, no. 10, p. 1750165, 2017.

[3] J. Belikov, U. Kotta, and A. Tepljakov, "Algebraic approach for analysis and control of a water tank system," *Information Technology And Control*, vol. 45, no. 2, pp. 175–183, 2016.

[4] A. Tepljakov, E. A. Gonzalez, E. Petlenkov, J. Belikov, C. A. Monje, and I. Petráš, "Incorporation of fractional-order dynamics into an existing PI/PID DC motor control loop," *ISA Transactions*, vol. 60, pp. 262–273, 2016.

[5] A. Tepljakov, E. Petlenkov, and J. Belikov, "Fractional-order digital filter approximation method for embedded control applications," *International Journal of Microelectronics and Computer Science*, vol. 5, no. 2, pp. 54–60, 2014.

[6] A. Tepljakov, E. Petlenkov, and J. Belikov, "Tuning and digital implementation of a fractional-order PD controller for a position servo," *International Journal of Microelectronics and Computer Science*, vol. 4, no. 3, pp. 116–123, 2013.

[7] A. Tepljakov, E. Petlenkov, and J. Belikov, "Application of Newton's method to analog and digital realization of fractional-order controllers," *International Journal of Microelectronics and Computer Science*, vol. 3, no. 2, pp. 45–52, 2012.

[8] A. Tepljakov, E. Petlenkov, and J. Belikov, "FOMCON: a MATLAB toolbox for fractional-order system identification and control," *International Journal of Microelectronics and Computer Science*, vol. 2, no. 2, pp. 51–62, 2011.

Conference proceedings

[1] K. Vassiljeva, A. Tepljakov, E. Petlenkov, and E. Netšaev, "Computational intelligence approach for estimation of vehicle insurance risk level," in *2017 International Joint Conference on Neural Networks (IJCNN)*. IEEE, 2017, pp. 4073–4078.

[2] B. B. Alagoz, A. Tepljakov, E. Petlenkov, and C. Yeroglu, "Multi-loop model reference adaptive control of fractional-order PID control systems," in *2017 40th International Conference on Telecommunications and Signal Processing (TSP)*. IEEE, 2017.

[3] I. Dimeas, C. Psychalinos, A. Elwakil, and A. Tepljakov, "OTA-C realization of PI$^{\lambda}$ brake and throttle controllers for autonomous vehicles," in *2017 European Conference on Circuit Theory and Design (ECCTD)*. IEEE, 2017, pp. 1–4.

[4] A. Kose, E. Petlenkov, A. Tepljakov, and K. Vassiljeva, "Virtual reality meets intelligence in large scale architecture," in *Lecture Notes in Computer Science*. Springer International Publishing, 2017, pp. 297–309.

[5] A. Kose, A. Tepljakov, and S. Astapov, "Real-time localization and visualization of a sound source for virtual reality applications," in *2017 25th International Conference on Software, Telecommunications and Computer Networks (SoftCOM)*. IEEE, 2017, pp. 1–6.

[6] A. Tepljakov, E. Gonzalez, E. Petlenkov, and I. Petras, "Design of a matlab-based teaching tool in introductory fractional-order systems and controls," in *Proc. of 2017 Frontiers in Education Conference (FIE'2017)*, 2017, pp. 1–4.

[7] V. Vansovits, B. I. Godoy, A. Tepljakov, K. Vassiljeva, and E. Petlenkov, "Model-based control design for a district heating plant," in *2017 IEEE 15th International Conference on Industrial Informatics (INDIN)*. IEEE, 2017, pp. 615–620.

[8] A. Tepljakov, S. Astapov, E. Petlenkov, K. Vassiljeva, and D. Draheim, "Sound localization and processing for inducing synesthetic experiences in virtual reality," in *Proc. 15th Biennial Baltic Electronics Conference*, 2016, accepted for publication.

[9] A. Tepljakov, E. Petlenkov, and J. Belikov, "Digital implementation of retuning fractional controllers for an existing closed-loop magnetic levitation control system," in *Proc. of 39th International Conference on Telecommunications and Signal Processing*, 2016.

[10] V. Vansovits, A. Tepljakov, K. Vassiljeva, and E. Petlenkov, "Towards an intelligent control system for district heating plants: Design and implementation of a fuzzy logic based control loop," in *IEEE International Conference on Industrial Informatics (INDIN'2016)*, 2016, pp. 405–410.

[11] J. Belikov and A. Tepljakov, "On controllability of switched linear systems on time scales," in *Proc. 2015 European Control Conference (ECC)*, 2015, pp. 1730–1735.

[12] A. Tepljakov, E. Petlenkov, and J. Belikov, "Robust FOPI and FOPID controller design for FFOPDT plants in embedded control applications using frequency-domain analysis," in *Proc. 2015 American Control Conference (ACC)*, 2015, pp. 3868–3873.

[13] A. Tepljakov, E. Petlenkov, and J. Belikov, "FOPID controlling tuning for fractional FOPDT plants subject to design specifications in the frequency domain," in *Proc. 2015 European Control Conference (ECC)*, 2015, pp. 3507–3512.

[14] K. Vassiljeva, A. Tepljakov, and E. Petlenkov, "NN-ANARX model based control of liquid level using visual feedback," in *IEEE International Conference on Industrial Informatics (INDIN'2015)*, 2015, pp. 133–138.

[15] A. Tepljakov, E. Petlenkov, and J. Belikov, "Embedded system implementation of digital fractional filter approximations for control applications," in *Proc. 21st Int. Mixed Design of Integrated Circuits and Systems (MIXDES) Conference*, 2014, pp. 441–445.

[16] A. Tepljakov, E. Petlenkov, and J. Belikov, "Gain and order scheduled fractional-order PID control of fluid level in a multi-tank system," in *2014 International Conference on Fractional Differentiation and its Applications*, 2014, pp. 1–6.

[17] A. Tepljakov, E. Petlenkov, and J. Belikov, "Closed-loop identification of fractional-order models using FOMCON toolbox for MATLAB," in *Proc. 14th Biennial Baltic Electronics Conference*, 2014, pp. 213–216.

[18] A. Tepljakov, E. Petlenkov, J. Belikov, and E. A. Gonzalez, "Design of retuning fractional PID controllers for a closed-loop magnetic levitation control system," in *ICARCV 2014 : The 13th International Conference on Control, Automation, Robotics & Vision*, 2014, pp. 1345–1350.

[19] V. Vansovits, E. Petlenkov, K. Vassiljeva, A. Tepljakov, and J. Belikov, "Application of MPC to industrial water boiler control system in district heat plant," in *ICARCV 2014 : The 13th International Conference on Control, Automation, Robotics & Vision*, 2014, pp. 1609–1614.

[20] A. Tepljakov, E. Petlenkov, J. Belikov, and M. Halás, "Design and implementation of fractional-order PID controllers for a fluid tank system," in *Proc. 2013 American Control Conference (ACC)*, Washington DC, USA, 2013, pp. 1780–1785.

[21] A. Tepljakov, E. Petlenkov, J. Belikov, and J. Finajev, "Fractional-order controller design and digital implementation using FOMCON toolbox for MATLAB," in *Proc. of the 2013 IEEE Multi-Conference on Systems and Control conference*, 2013, pp. 340–345.

[22] A. Tepljakov, E. Petlenkov, J. Belikov, and S. Astapov, "Digital fractional-order control of a position servo," in *Proc. 20th Int. Mixed Design of Integrated Circuits and Systems (MIXDES) Conference*, 2013, pp. 462–467.

[23] A. Tepljakov, E. Petlenkov, and J. Belikov, "Efficient analog implementations of fractional-order controllers," in *Proc. of the 14th International Carpathian Control Conference (ICCC)*, 2013, pp. 377–382.

[24] A. Tepljakov, E. Petlenkov, and J. Belikov, "Application of the Newton method to first-order implicit fractional transfer function approximation," in *Proc. 19th Int. Mixed Design of Integrated Circuits and Systems (MIXDES) Conference*, A. Napieralski, Ed., 2012, pp. 473–477.

[25] A. Tepljakov, E. Petlenkov, and J. Belikov, "Implementation and real-time simulation of a fractional-order controller using a MATLAB based prototyping platform," in *Proc. 13th Biennial Baltic Electronics Conference*, 2012, pp. 145–148.

[26] A. Tepljakov, E. Petlenkov, and J. Belikov, "A flexible MATLAB tool for optimal fractional-order PID controller design subject to specifications," in *Proceedings of the 31st Chinese Control Conference*, W. Li and Q. Zhao, Eds., Hefei, Anhui, China, 2012, pp. 4698–4703.

[27] A. Tepljakov, E. Petlenkov, and J. Belikov, "FOMCON: Fractional-order modeling and control toolbox for MATLAB," in *Proc. 18th Int. Mixed Design of Integrated Circuits and Systems (MIXDES) Conference*, A. Napieralski, Ed., 2011, pp. 684–689.

Patented Inventions

[1] A. Tepljakov, E. Petlenkov, and J. Belikov, "Virtual coupled tank system," Estonian Patent P201 400 045, 2017.

Computer Skills

Programming languages	C/C++, Assembler (Z80, AVR, x86), MATLAB, .NET, PHP, JavaScript, Java, Processing, Python, R
Software skills	MATLAB & Simulink, Scilab, Maxima & Mathematica, TEX & LATEX, Sprint Layout & EagleCAD, Blender (Modeling for 3D printing), Adobe Photoshop & Inkscape (Graphic design), NetBeans & Eclipse, Scribus (Desktop publishing), and Microsoft Office

Languages

Russian	mother tongue
English	fluent
Estonian	fluent
French	basic level
German	basic level

Freelance Work and Research

2011 – ...	Quantum mechanics and its applications in system theory, automatic control and psychology
2009 – ...	Design and implementation of embedded systems (hardware and software)
2003 – ...	Web-developer (HTML, CSS, WML & WMLS, JavaScript and jQuery, MySQL; CMS: Wordpress, Drupal)

Web Presence

Alpha Control Lab	http://a-lab.ee/people/aleksei-tepljakov
ETIS	https://www.etis.ee/portaal/isikuCV.aspx?PersonVID=67759
ResearchGate	https://www.researchgate.net/profile/Aleksei_Tepljakov
LinkedIn	https://www.linkedin.com/pub/aleksei-tepljakov/8b/395/948
Google Scholar	https://scholar.google.com/citations?user=QEePtsIAAAAJ

Personal Interests and Hobbies

Music (also playing guitar and drums), video games, photography.