

# Curriculum Vitae

<b>Name</b>	Aleksei Tepljakov
<b>Date of Birth</b>	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 – 2011	Electronics developer / Freelance
2005 – 2008	Metalworking plant / Engineer (machining)

## Degree Information

21.08.2015	<b>Doctor of Philosophy in Informatics and System Engineering</b> , 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	<b>Master of Science in Engineering</b> , 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

## 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

## Research

2010 – ...	Application of Fractional-order Calculus in system modeling, identification and control. Research and development of fractional-order mathematical models.
2014 – ...	Virtual and Augmented Reality applications. Modeling and visualization methods for immersive virtual environments.

## Administrative Responsibilities

2015 – ...	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
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## Publications

### Journal

- [1] 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.
- [2] 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.
- [3] 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.
- [4] 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.
- [5] 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.
- [6] 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.

### Conference proceedings

- [1] 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.
- [2] 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.
- [3] 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.

- [4] 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.
- [5] 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.
- [6] 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.
- [7] 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.
- [8] 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.
- [9] 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.
- [10] 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.
- [11] 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.
- [12] 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.
- [13] 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.

- [14] 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.
- [15] 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.
- [16] 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.
- [17] 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, June 2013, pp. 1780–1785.
- [18] 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.
- [19] 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.
- [20] 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.

## Patented Inventions

- [1] A. Tepljakov, E. Petlenkov, and J. Belikov, "Virtual coupled tank system," Estonian Patent P201 400 045, 2015, pending.

## Computer Skills

Programming languages	C/C++, Assembler (Z80, AVR, x86), MATLAB, .NET, PHP, JavaScript, Processing, Python, Java, R
Software skills	MATLAB & Simulink, Scilab, Maxima & Mathematica, T <sub>E</sub> X & L <sup>A</sup> T <sub>E</sub> X, Sprint Layout & EagleCAD, Blender, Adobe Photoshop & Inkscape (Graphic design), NetBeans & Eclipse, Scribus (Desktop publishing), Unreal Engine, and Microsoft Office

## Graphic Design Skills

Brand, print, and web design.

## 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)
2005 – ...	Web-developer (HTML, CSS, WML & WMLS, JavaScript and jQuery, MySQL; CMS: Wordpress, Drupal)

## **Web Presence**

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

## **Personal Interests and Hobbies**

Music and sound engineering; Photography.