



Санкт-Петербургский
государственный университет

St Petersburg University



St Petersburg University

Faculty of Mathematics and
Mechanics



**International educational and research programs
organized by the Department of Applied Cybernetics,
Faculty of Mathematics and Mechanics,
St. Petersburg State University**

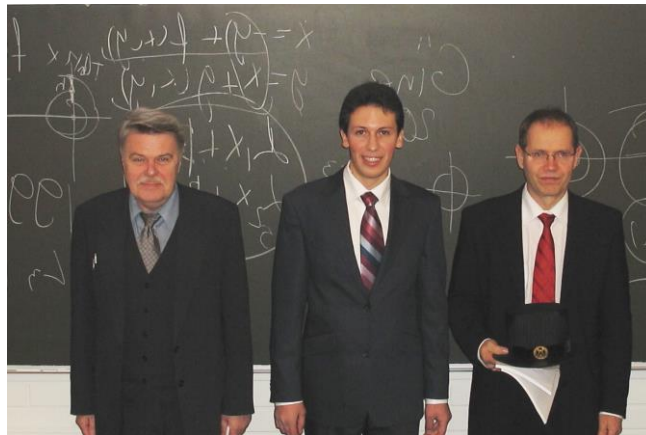
Prof. Nikolay V. Kuznetsov

07.11.2024

Joint program with the University of Jyväskylä

2007-2021 - the cooperation program between:

- the Department of Applied Cybernetics (St. Petersburg State University)
- the Faculty of Information Technology (the University of Jyväskylä)



Co-chairs: G. Leonov, N. Kuznetsov, P. Neittaanmäki

Supported by:



Study abroad stipends of President of the Russian Federation



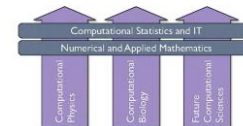
Russian Science Foundation



University of Jyväskylä COMAS



Academy of Finland



Finnish Doctoral Programme in Computational Sciences FICS

Recognition in Finland: News

Ainjakas ratkaisija

24-vuotias tutkija Olga Kuznetsova teki vauvan ja väitöskirjan. Tutkimus ratkaisi osittain yli 100-vuotiaan matemaattisen ongelman.

JYVÄSKYLÄ
Ville Jalonen

Jyväskylässä ratkaistiin osa yli sata vuotta vanhasta matemaattisesta ongelmasta Jyväskylän yliopiston ja Pietarin valtionyliopiston yhteisessä tutkimushankkeessa. Osittain ratkaistu ongelma on yksi David Hilbertin vuonna 1900 esittelemistä kuuluisista matemaattisista ongelmista.

Ongelmaan lisävala toi pietaarilais-jyväskyläläinen Olga Kuznetsova, 24. Hänen tietokenttikan väitöskirjansa tarkastetaan tänään Jyväskylän yliopiston informaatikenttikan tiedekunnassa.

Ajankäytön mestari
Kuznetsova on varsinaisen ajankäytön mestari. Väitöstutkimuksen ohessa Kuznetsova sai vauvan Konstantin-pojalla on nyt ikää seitsemän kuukautta.

Kuznetsova sanoo, että tutkan päivärutiini lisäksi salaisuus ajan riittämiseen on rauhallinen ja hyvin nukkuvaa lapsi.

– Vauva herää kahdeksalta, ja sitten syöme ja leikimme kymmenen asti. Sen jälkeen vauva nukkuu kahtentoista asti, jolloin ehdin työskennellä kaksi tuntia. Sitten leikimme, syöme ja käymme kävelyllä ja niin edelleen kello kolmeen asti. Tämän jälkeen ehdin työskennellä toiset kolme tuntia.

– Vauva nauttii kolmesta päivässä ja kun hän menee yöpuhla, minulla on illalla ja yöllä tehtäviä töitä. Joskus en nuku kovinkaan paljoa.

Vähäistä yöhönistä huolimatta



SAAVUTUKSET Pietarilais-jyväskyläläinen Olga Kuznetsova sanoo seitsemänkuukautisen Konstantin-polkansa ja väitöskirjansa olevan suurimmat saavutuksensa. Äidin ja tutkijan roolin yhteensovittaminen on vaikeaa, mutta mahdollista, hän kertoo.

8 KESKISUOMALAINEN

Kotimaa

Kaksi verroin väitösjännitystä

Jyväskylän yliopisto: Identtiset kaksoiset Marat ja Renat Yuldashev väittelevät tohtoreiksi perättäisinä päivinä.

JYVÄSKYLÄ
Taru Kovanen

Kun Marat Yuldashev väitö tarkastetaan tänään Jyväskylän yliopistossa, seuraa tilaisuutta yleisöksi hänen identtinen kaksoisveljensä Renat Yuldashev. Huomenna roolit ovat toisin päin, kun Renat väittelee ja on Maratin vuoro kannustaa veljeään.

– Omaa väitöskirjaani kirjoitin vähän, mutta veljen puolesta en ole huolissani, Marat sanoo. 24 vuotta vanha veljeväkeli väittelee molemmat tietokenttikan alalta. Yliopistolla olisi haluttu sijoittaa veljesten historialliset väitöskirjat samalle päivälle, mutta aikataulu ei opint vastaväittelijä.

Dekaani Pekka Neittaanmäki Jyväskylän yliopiston informaatikenttikan tiedekunnasta ei muista vastaväittelijä tapusta.

– Jyväskylässä tullaista ei ollut. Mahtaa olla aika harvinaista koko Suomessa, Neittaanmäki sanoo.

Marat ja Renat ovat kotoisin Kazakosta-Venäjästä sijaitsevalta Ustia. Vanhemmat ovat moilemmat lääketieteen tohtoreita.

– Veljekset myöntävät, että painetta lääketieteen opiskelussa oli. Marat ja Renat päättivät kuitenkin seurata omaa polkuaan. Vuonna 2006 he aloittivat tietokenttikan opinnot Pietarin yliopistossa.

Pietarin ja Jyväskylän yliopistojen jo 25 vuotta jatkunut yhteistyö avasi veljeille vuonna 2010 mahdollisuuden opiskella Jyväskylässä.

– Viime vuonna Marat ja Renat saivat molemmat Venäjän presidentin Vladimir Putinin stipendin, joka on tarkoitettu väitöskirjuri tekoon ulkomaisessa yliopistossa. Stipendin sai koko Venäjällä 40 ja Pietarin yliopistossa vain kolme opiskelijaa.

– Ylitimme kovasti. Olimme ihan varmoksi, että vain toinen meistä saa stipendin, Marat sanoo.

Identtisestä urasta kaksoisveljesten kanssa on molempien mukaan ollut enemmän hyötyä kuin haittaa.

– Meidän on helppo kirjoittaa esseitä yhdessä ja antaa toisillemme kommentteja, Marat kertoo.

– Veljekset kirjoittivat suurimman osan väitöskirjaan kuuluvista 22 julkaisusta yhdessä. Sisärisen kanssa työskentely voisi kaverilla tuottaa hyvien tulosten lisäksi myös meheviä riitoja. Sopu kuitenkin säilyi väitöskirjan veljesten välillä.

– Emme ole kaikkista aina samaa mieltä, mutta emme riidellä koskaan, Renat sanoo.

– No, ehkä riitelimme joskus kymmenen vuotta sitten, matkaa emme enää ryökäily, Marat lisää.



Vieraat sekoittavat Marat (vas.) ja Renat Yuldashev keskenään päivittäin. Kaksoet erottaa siitä, että Marat on veljensä hieman pidempi.

Väitöskirjat Marat ja Renat asuivat Pietarissa, yhteisessä asunnossa tietenkin. Jyväskylään he kalkevat bussilla.

Kazakstanin rajan lähellä sijaitsevalta Ustia on lähes 2000 kilometrin matka Pietariin. Sieltä katuautuna reitti 450 kilometriä Pietarista Jyväskylään onkin ensä pölkkyä.

Opiskelu Suomessa on veljelesten mukaan hyvin erilaista kuin Venäjällä.

– Venäjällä opiskelu on teoreettisempaa. Suomessa taas keskitytään enemmän käytäntöön, Renat sanoo.

Yuldasheviltä alkavat jossakin työskentellä akateemissa maastamassa. Suurimmiten mo nuorkaistilla on tutkijan arat Pietarin yliopistossa. He myös työtoivat yhteistyönä Jyväskylän yliopiston kanssa jatkavan.

– Mutta ensin on alia julkaista tuoreita tohtorintutkimuksia.

– Juhlimme tuplasti, veljeleste mauryat.

MARAT JA RENAT YULDASHEV

Väitöskirjat tietokenttikan

– MSC Renat Yuldashev tietokenttikan väitöskirja "Synthetic Phase-Locked Loop analysis methods and simulation" tarkastetaan 18.12. Väitöstyössä tutkitaan taajuustasossa muodollista matemaattisia malleja.

Recognition in Finland: visiting professor and medal



Home > [Informaatioteknologian tiedekunta](#) > [In English](#) > [News](#) > 10 years of collaboration between University of Jyväskylä and Saint-Petersburg State University

10 years of collaboration between University of Jyväskylä and Saint-Petersburg State University

last modified Jul 06, 2016 01:06 PM

The anniversary of collaboration between University of Jyväskylä and Saint-Petersburg State University was celebrated in the University of Jyväskylä June 17 by two defences of Ph.D. theses, prepared in the framework of Finnish-Russian Educational & Research program in Applied mathematics and information technologies.

This program was organized by the Dean of the Faculty of Information Technology Prof. Pekka Neittaanmäki (University of Jyväskylä) and the Dean of Mathematics & Mechanics Faculty Prof. Gennady Leonov (Saint-Petersburg State University).

This year the coordinator of the program Dr. Nikolay Kuznetsov from Saint-Petersburg State University was named as Visiting professor in the the University of Jyväskylä.

In total 11 Ph.D. theses have been prepared and defended during last 10 years in the framework of the program, three of these works were supported by the Scholarship of the President of Russia.

This collaboration allows to combine the theoretical mathematical methods, developed in the group of Gennady Leonov, and modern approaches for the numerical analysis and simulation of real-world systems, developed in the group of Pekka Neittaanmäki, and thus to obtain breakthrough results in the area of computer architecture, telecommunications and drilling systems.

We hope that the combining the efforts of these two research groups of P. Neittaanmäki and G. Leonov will allow the two countries - Russia and Finland to take a leading position in these areas.


Today Nikolay Kuznetsov was named as Junior Visiting Professor

N. Kuznetsov received his Candidate degree from Saint-Petersburg State University, Russia, in 2004 and Ph.D. degree from the University of Jyväskylä, Finland, in 2008.

From 2007 he is coordinator of Finnish-Russian Educational & Research program in Applied mathematics and information technologies organized by the Faculty of Information Technology (University of Jyväskylä) and Mathematics & Mechanics Faculty (Saint-Petersburg State University).

His interests are now in analytical-numerical analysis of dynamical systems, chaos theory, phase synchronization systems, and nonlinear control systems. He has supervised 9 PhD students in the University of Jyväskylä.





JYVÄSKYLÄN YLIOPISTO

Faculty of Information Technology

Faculty Council of the Faculty of Information Technology has today conferred
the title of Docent in
Dynamical Systems to

Dr. Nikolay Kuznetsov

Jyväskylä May 28, 2014

Dean *Pekka Neittaanmäki*
Head of Administration *Tiina Nyüssönen*

According to the Universities' Act (559/2009) the university may, upon application, confer the title of Docent to a person, who has in-depth knowledge of the field of research, ability to independent scientific research, or artistic work, proven by publications or in some other way, and pedagogical skills.

By provision of the Administrative Rules of the university the title of Docent is conferred by the Faculty Council.

The university and the Docent agree separately on the tasks and their compensation that are related to teaching and other duties required by the university. The university may also allocate its premises for the Docent's use.



FACULTY OF INFORMATION TECHNOLOGY

May 21th 2014

DEAN'S DECISION ON THE DEMONSTRATION OF LANGUAGE AND TEACHING SKILLS

The Faculty Council of the Faculty of Information Technology agreed at its meeting on January 29th 2014 to invite Dr. Nikolay Kuznetsov to give a guest lecture to demonstrate his language and teaching skills regarding his application for the title of docent of mathematical information technology, his area of expertise being "Dynamical Systems".

Dr. Kuznetsov gave a guest lecture to the staff and students of the faculty on the topic "Hidden oscillations in dynamical systems. Theory and Applications." on May 21th 2014. Dean Pekka Neittaanmäki acted as chairman at the event.

By this decision I accept the guest lecture given by Dr. Nikolay Kuznetsov as sufficient proof of the language and teaching skills required for the title of docent.

P. Neittaanmäki
Dean Pekka Neittaanmäki

Tiina Nyüssönen
Head of Faculty Administration Tiina Nyüssönen

Recognition in Finland: Election as external members to the Finnish Academy of Science and Letters



SUOMALAINEN TIEDEAKATEMIA
FINNISH ACADEMY OF SCIENCE AND LETTERS
ACADEMIA SCIENTIARUM FENNICA

KUTSUU TEIDÄT

professori

Gennady A. Leonov

ULKOMAISEKSI JÄSENEKSEEN
SITEN ILMAISTAKSEEN
TUNNUSTUKSENSA ERINOMAISISTA
TIETEELLISISTÄ ANSIOISTANNE

HELSINGISSÄ HUHTIKUUN 21. PÄIVÄNÄ 2017

SUOMALAINEN TIEDEAKATEMIA

Kirsi Tuuri
ESIMIES

Pell
PÄÄSIHTEERI



SUOMALAINEN TIEDEAKATEMIA
FINNISH ACADEMY OF SCIENCE AND LETTERS
ACADEMIA SCIENTIARUM FENNICA

KUTSUU TEIDÄT

professori

Nikolay Kuznetsov

ULKOMAISEKSI JÄSENEKSEEN
SITEN ILMAISTAKSEEN
TUNNUSTUKSENSA ERINOMAISISTA
TIETEELLISISTÄ ANSIOISTANNE

HELSINGISSÄ SYYSKÄJUN 4. PÄIVÄNÄ 2020

SUOMALAINEN TIEDEAKATEMIA

Anna-Maria
ESIMIES

Pell
PÄÄSIHTEERI



ПОСОЛ
РОССИЙСКОЙ ФЕДЕРАЦИИ
В ФИНЛЯНДСКОЙ РЕСПУБЛИКЕ

РЕКТОРУ
САНКТ-ПЕТЕРБУРГСКОГО
ГОСУДАРСТВЕННОГО
УНИВЕРСИТЕТА

Н.М.КРОПАЧЕВУ

Уважаемый Николай Михайлович,

В связи с избранием заведующего кафедрой прикладной кибернетики Санкт-Петербургского государственного университета доктора физико-математических наук профессора Н.В.Кузнецова иностранным членом Финской академии науки и литературы хотел бы поздравить с этим профессора Н.В.Кузнецова и весь коллектив университета. Решение финского научного сообщества стало признанием заслуг ученых, работающих под Вашим руководством, в развитии сотрудничества между Россией и Финляндией в области науки и образования на благо дальнейшего укрепления традиционного добрососедства двух стран.

Посольство России в Финляндии со своей стороны готово и далее оказывать необходимую помощь в дальнейшем развитии многопланового взаимодействия СПбГУ с финскими партнерами.

С уважением,
И.В. Кузнецов
И.В.КУЗНЕЦОВ

№ 525
«16» октября 2020г.

Recognition in Russia: Honorary Doctor SPbU



ДИПЛОМ ПОЧЕТНОГО ДОКТОРА САНКТ-ПЕТЕРБУРГСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА

УЧЕНЫЙ СОВЕТ
САНКТ-ПЕТЕРБУРГСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА
29 МАРТА 2010 ГОДА
ПО С Т А Н О В И А

ЗА ВЫДАЮЩИЙСЯ ВКЛАД
В РАЗВИТИЕ ВЫЧИСЛИТЕЛЬНЫХ МЕТОДОВ
И ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ
ПРИСВОИТЬ ПРОФЕССОРУ

ПЕККЕ НЕЙТТААНМЯКИ

ЗВАНИЕ «ПОЧЕТНЫЙ ДОКТОР
САНКТ-ПЕТЕРБУРГСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА»,
КОТОРОЕ ОБЕСПЕЧИВАЕТ ЕМУ ПРАВА, ПОЧЕСТИ И ПРИВИЛЕГИИ,
УСТАНОВЛЕННЫЕ УСТАВОМ И УНИВЕРСИТЕТСКИМИ ТРАДИЦИЯМИ

— D S C E —
N O S
R E C T O R E T S E N A T U S U N I V E R S I T A T I S P E T R O P O L I T A N A E
D I E X X I X M E N S I S M A R T I A N N O M M X
I N P R O F E S S O R E M

ПЕККА НЕЙТТААНМÄКИ

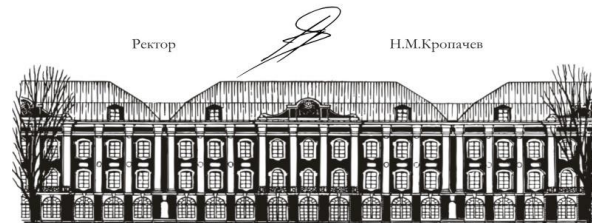
DE COMPUTANDI VIA AC RATIONE AD STUDIA MATHEMATICA FELICITER ADHIBENDA,
DE ARTIBUS DOCTRINISQUE AD MACHINAS COMPUTATRICES PERTINENTIBUS
UTILISSIME ELABORANDIS

DOCTORIS HONORIS CAUSA UNIVERSITATIS PETROPOLITANAE

NOMEN ET HONORES, IURA ET PRIVILEGIA
LEGIBUS ET MORE UNIVERSITATIS INSTITUTA CONTULIMUS

Ректор

Н.М.Кропачев





Support by the Russian government

- Scholarships from the President of the Russian Federation to study abroad.
- The successes of the programme were discussed in 2016 and 2019 in preparation for meetings between the presidents of Russia and Finland.

The Program for Scientific and Technological Development of the Russian Federation (No. 568 of 20.06.2014, No. 377 of 29.03.2019): implementation of the Program of **social support for citizens of the Russian Federation who independently entered leading foreign educational organizations ... to ensure their employment in organizations registered in the territory of the Russian Federation, in accordance with the qualifications obtained.**

- The rector of St. Petersburg university allocated special positions for graduates of the programs.



МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ
РОССИЙСКОЙ ФЕДЕРАЦИИ
(МИНОБРНАУКИ РОССИИ)

П Р И К А З

« 3 » июня 2015 г.

№ 558

Москва

О стипендиях Президента Российской Федерации,
направляемых на обучение за рубеж в 2015/16 учебном году

СЛУЖЕБНАЯ ЗАПИСКА

Ректору СПбГУ
Н.М. Кропачеву

20.06.2016 № 79-22-130
на № _____ от _____

Глубокоуважаемый Николай Михайлович!

В июле планируется встреча Президентов России Владимира Путина и Финляндии Саули Нийнистё. Финская сторона в качестве достижения этого года будет отмечать сотрудничество исследовательских групп Г.А. Леонова и П. Нейтаанмяки (декан факультета информационных технологий Университета Ювяскюля, Финляндия; Почетный доктор СПбГУ). В настоящее время идет соответствующая подготовка документов.

Joint program with LUT University: Agreement

2021-2022^x - the cooperation program between:

- the Department of Applied Cybernetics (St. Petersburg University)
- the System Engineering group (LUT University)

Co-chairs:
Nikolay Kuznetsov,
Leonid Chechurin



**Letter
of common understanding**
01 February 2021

Saint-Petersburg State University and Lappeenranta-Lahti University of Technology have had cooperation agreement on double doctor degree process since 26.04.2016. In the framework of the agreement Prof. N.Kuznetsov (SPbSU) and Prof. L.Chechurin (LUT) have been discussing the subject and reached understanding of further necessary steps as well as join research topics. First candidates for join scientific supervision applied for LUT PhD school.

**Письмо
о взаимопонимании**
01 февраля 2021

Санкт-Петербургский государственный университет и Лаппеэнранта-Лахти Технологический Университет имеют соглашение о сотрудничестве в развитии программы двойных докторских (PhD) дипломов от 26.04.2016 года. В рамках этого соглашения с 2020 году ведутся консультации между профессором СПбГУ Н.Кузнецовым и профессором ЛУТ Л.Чечуриным. Достигнуто общее понимание необходимых шагов для установления практики двойных дипломов, и тем общих научных работ, инициирован процесс поступления в аспирантуру ЛУТ сотрудников СПбГУ.

*Novikova, Kuini, Hokkanen,
Samsten, Hamäläinen, Sandström*

LAPPEENRANNAN TEKNILLINEN
YLIOPISTO
№ 171/132/2016
28/4/2016

**Agreement for the double doctoral degree between Lappeenranta University
of Technology and St. Petersburg State University**

**Соглашение о двойной докторской степени между Лаппеэнрантским
технологическим университетом и Санкт-Петербургским
государственным университетом**



Joint program with LUT University: Support and engagement


 ПРАВИТЕЛЬСТВО РОССИЙСКОЙ ФЕДЕРАЦИИ
 ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ
 ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ
 ВЫСШЕГО ОБРАЗОВАНИЯ
 «САНКТ-ПЕТЕРБУРГСКИЙ
 ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ»
 (СПбГУ)
 Университетская наб. 7/9, Санкт-Петербург, 199034
 тел./факс 328-97-98
 http://www.spbu.ru
 ОКПО 02068516 ОГРН 1037800006089
 ИНН/КПП 7801002274/780101001
 10.04.2021 № 01/1-34-195
 на № _____ от _____

Finnish National Agency
for Education
TFK-programme@oph.fi



Supported
by:
FINNISH NATIONAL
AGENCY FOR EDUCATION

Team Finland Knowledge programme №163/83/2021
"Platform of Excellence for Complex System design:
toward Double Doctor Degree between leading
research schools of Finland and Russia"
(LUT, SPBU, Polytech)

Commitment letter (TFK statement)

This is the letter to confirm the participation of Saint-Petersburg State University (SPbSU) in the project «Platform of Excellence for Complex System design: toward Double Doctor Degree between leading research schools of Finland and Russia» submitted by Lappeenranta-Lahti University of Technology (Finland) to TFK PROGRAMME CALL FOR APPLICATIONS 2021 (<https://www.oph.fi/sites/default/files/documents/TFK%20programme%20Call%20for%20Applications%202021.pdf>).

The contact person for the project in SPbSU is professor, Head of the Dept. of Applied Cybernetics Nikolay Kuznetsov (n.v.kuznetsov@spbu.ru, +79213330466).

The role of SPbSU in the project is:

- participation in the educational, scientific and administrative design of join Double Doctor Degree Program in Complex System Design;
- join scientific supervision of PhD students;
- promotion the DDD program in SPbSU and selection of candidates;
- hosting of DDD students and staff from LUT University at SPbSU (within the project budget allocations) by providing the access to the university and Prof. Kuznetsov research facilities and group;
- join development of educational component of DDD program in the form of international high quality courses on the topics or the PhD school.

Prof. Nikolai Kuznetsov has been working with Finnish universities for already 13 years. His efforts have been acknowledge by electing him as the Foreign member of Finnish Academy of Science this year. Prof. Kuznetsov and his research group are committed to contribute further to this cooperation, that is completely in line with the international policy and strategy of SPbSU.

The project of DDD program development is of the highest priority for SPbSU, cooperation with LUT University has a history, and there have been a number of examples of fruitful research and educational cooperation. The proposal will turn particular and individual efforts into the

deserved shape of systematic, sustainable cooperation grounded in join PhD school program. The framework cooperation agreement between SPbSU and LUT University has been effective for already 5 years and being actively discussed now to enforce the join DDD component.

Project's participants can use existing programs for support academic mobility in Saint-Petersburg State University (on a competitive basis without special allocation of funding to the project).

Vice-Rector for Research



Sergei Mikushev

PhD Degrees: 14 PhD dissertations over a 14-year period at JyU



Nikolay
Kuznetsov
2008



Elena
Kudryashova
2009



Olga
Kuznetsova
2011



Vladimir
Vagaytsev
2012



Maria
Kiseleva
2013



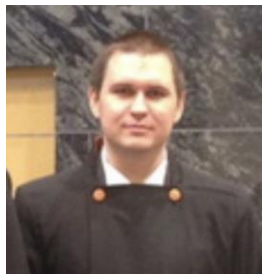
Marat
Yuldashev
2013



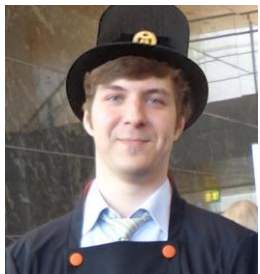
Elena
Solovyeva
2013



Renat
Yuldashev
2013



Alexander
Zaretskiy
2013



Konstantin
Aleksandrov
2016



Timur
Mokaev
2016



Nataliya
Stankevich
2017



Ruslan
Mokaev
2019



Mikhail
Blagov
2021

PhD Degrees: Joint program with LUT University



Mikhail Lobachev

ANALYTICAL-NUMERICAL METHODS FOR NONLINEAR ANALYSIS AND SYNTHESIS OF PHASE-LOCKED LOOPS

Dissertation for the degree of Doctor of Science (Technology) to be presented with due permission for public examination and criticism at Lappeenranta-Lahti University of Technology LUT, Lappeenranta, Finland on the 21st of September, 2024, at noon.



Tatiana Alekseeva

FORECASTING AND CONTROL IN NONLINEAR ECONOMIC MODELS WITH APPLICATION TO ECONOMIC POLICY

ON-LINE defences 21 September 2024



DEGREE CERTIFICATE DOCTOR OF SCIENCE (TECHNOLOGY)

Lappeenranta-Lahti University of Technology LUT
LUT School of Engineering Sciences

Tatiana Alekseeva

has completed the following degree as provided in the government decree on university degrees and professional specialisation programmes (794/2004): Doctor of Science (Technology), Engineering Science, with Industrial engineering and management as the research field.

12 October 2024

JUHA-MATTI SAKSA
Rector

The Certificate is electronically signed. The authenticity of the document can be verified from the original file and at <https://lut.fi/validate> or at the website of Digital and population data services agency at <https://dov.fi/en/validation>.

This degree certificate is composed of three parts: in addition to this certificate, it contains a transcript providing information on the studies included in the degree, and a diploma supplement for international use, providing information on the university and the completed degree, its level and its status in the Finnish education system. The graduate has been granted an original degree certificate in Finnish and English.



Joint programs: Dissertations

JYU DISSERTATIONS 172

Ruslan Mokaev

Effective Analytical-Numerical Methods for the Study of Regular and Chaotic Oscillations in Dynamical Systems



Author	Ruslan Mokaev Faculty of Information Technology University of Jyväskylä Finland Faculty of Mathematics and Mechanics St. Petersburg State University Russia
Supervisors	Professor Pekka Neittaanmäki Faculty of Information Technology University of Jyväskylä Finland Professor Nikolay V. Kuznetsov Faculty of Information Technology, University of Jyväskylä Finland, Faculty of Mathematics and Mechanics St. Petersburg State University Russia Professor Timo Tiihonen Faculty of Information Technology University of Jyväskylä Finland
Reviewers	Professor Marius-E Danca Department of Mathematics and Computer Science, Avram Iancu University, Cluj-Napoca Romania Romanian Institute of Science and Technology Cluj-Napoca Romania Professor Sergei Abramovich School of Education and Professional Studies State University of New York at Potsdam USA
Opponent	Professor Vladimir Rasvan Department of Automation Electronics and Mechatronics University of Craiova, Craiova, Dolj Romania

LIST OF INCLUDED ARTICLES

- PI G.A. Leonov, N.V. Kuznetsov, M.A. Kiseleva, R.N. Mokaev. Global Problems for Differential Inclusions. Kalman and Vyshnegradskii Problems and Chua Circuits. *Differential Equations*, Vol. 53, No. 13, PP. 1671–1702, <https://doi.org/10.1134/S0012266117130018>, 2017.
- PII E.D. Akimova, I.M. Boiko, N.V. Kuznetsov, R.N. Mokaev. Analysis of oscillations in discontinuous Lurie systems via LPRS method. *Vibroengineering PROCEDIA*, Vol. 25, PP. 177–181, <https://doi.org/10.21595/vp.2019.20817>, 2019.
- PIII N.V. Kuznetsov, O.A. Kuznetsova, D.V. Koznov, R.N. Mokaev, B.R. Andrievsky. Counterexamples to the Kalman Conjectures. *IFAC-PapersOnLine*, Vol. 51, I. 33, PP. 138–143, <https://doi.org/10.1016/j.ifacol.2018.12.107>, 2018.
- PIV N.V. Kuznetsov, O.A. Kuznetsova, T.N. Mokaev, R.N. Mokaev, M.V. Yuldashev, R.V. Yuldashev. Coexistence of hidden attractors and multistability in counterexamples to the Kalman conjecture. *Proceedings of the 11th IFAC Symposium on Nonlinear Control Systems*, 2019 (accepted to IFAC-PapersOnLine).
- PV E.V. Kudryashova E.V., Kuznetsov N.V., Kuznetsova O.A., Leonov G.A., Mokaev R.N. Harmonic Balance Method and Stability of Discontinuous Systems. In: *Matveenko V., Krommer M., Belyaev A., Irschik H. (eds) Dynamics and Control of Advanced Structures and Machines*. Springer, Cham, PP. 99–107, https://doi.org/10.1007/978-3-319-90884-7_11, 2019.
- PVI N.V. Kuznetsov, T.N. Mokaev, E.V. Kudryashova, O.A. Kuznetsova, R.N. Mokaev, M.V. Yuldashev, R.V. Yuldashev. Stability and Chaotic Attractors of Memristor-Based Circuit with a Line of Equilibria. *Lecture Notes in Electrical Engineering*, PP. 639–644, https://doi.org/10.1007/978-3-030-14907-9_62, 2020.
- PVII G.A. Leonov, R.N. Mokaev, N.V. Kuznetsov, T.N. Mokaev. Homoclinic Bifurcations and Chaos in the Fishing Principle for the Lorenz-like Systems. *International Journal of Bifurcation and Chaos*, Vol. 30 (accepted, preprint <https://arxiv.org/pdf/1802.07694.pdf>), 2020.
- PVIII N.V. Kuznetsov, T.N. Mokaev, R.N. Mokaev, O.A. Kuznetsova, E.V. Kudryashova. A lower-bound estimate of the Lyapunov dimension for the global attractor of the Lorenz system. *preprint, arXiv:1910.08740*, <https://arxiv.org/pdf/1910.08740.pdf>, 2019.

Results: Joint programs (2008-2024)

16 dissertations for the degree of Doctor of Science and Doctor of Philosophy, 4 theses for the degree of Master of Science from the University of Jyväskylä and Lappeenranta-Lahti University of Technology.

The high scientific and educational level of these programs is confirmed by the fact that more than **35%** of program graduates received **doctoral degrees with distinction** (which significantly exceeds the recommended level of 10-15% in European universities), and more than **35%** of program graduates received **professor positions**.

This was a unique achievement among similar international programs in which our Finnish partners participated.

1149	FORECASTING AND CONTROL IN NONLINEAR ECONOMIC MODELS WITH APPLICATION TO ECONOMIC POLICY	Trainee Addressed	
1148	ANALYTICAL-NUMERICAL METHODS FOR NONLINEAR ANALYSIS AND SYNTHESIS OF PHASE-LOCKED LOOPS	Mikhail Lebedev	
1147	REGULAR BEHAVIOR EXACT LOCK-IN RANGE FOR CLASSICAL PHASE-LOCKED LOOPS		172
	RUSLAN MOKRATOV EFFECTIVE ANALYTICAL-NUMERICAL METHODS FOR THE STUDY OF REGULAR AND CHAOTIC OSCILLATIONS IN DYNAMICAL SYSTEMS		
	NATALIYA STANNIKOVA BIFURCA AND SELF-EXCITED ATTRACTORS IN BIODYNAMICAL AND BIOPHYSICAL MODELS		271
	TIMUR MOKRATOV LOCALIZATION AND DIMENSION ESTIMATION OF ATTRACTORS IN THE GALPINSKY-ZOUZINSKY SYSTEM		240
	KONSTANTIN ALEKSEENKOV PHASE-LOCKED LOOPS WITH ACTIVE PI FILTER: THE LOCK-IN RANGE COMPUTATION		239
	ELENA SOLOVIEVA MATHEMATICAL MODELS AND STABILITY ANALYSIS OF INDUCTION MOTORS UNDER SUDDEN CHANGES OF LOAD		182
	MARIA KISELEVA OSCILLATIONS OF DYNAMICAL SYSTEMS APPLIED IN DRILLING: ANALYTICAL AND NUMERICAL METHODS		181
	ALEXANDER ZAKHAROV MATHEMATICAL MODELS AND STABILITY ANALYSIS OF THREE-PHASE SYNCHRONOUS MACHINES		179
	RENAT YULDISHEV SYNTHESIS OF PHASE-LOCKED LOOP: ANALYTICAL METHODS AND SIMULATION		175
	MARAT YULDISHEV MATHEMATICAL MODELS AND SIMULATION OF COGAS LOOPS		174
	VLADIMIR YAGOVITSEV ANALYTICAL-NUMERICAL METHODS FOR FINDING HIDDEN OSCILLATIONS IN DYNAMICAL SYSTEMS		158
	OLGA KUZNETSOVA LYAPUNOV QUANTITIES AND LIMIT CYCLES IN TWO-DIMENSIONAL DYNAMICAL SYSTEMS		137
	ELENA KUDRYASHOVA CYCLES IN CONTINUOUS AND DISCRETE DYNAMICAL SYSTEMS		107
	NIKOLAY V. KUZNETSOV STABILITY AND OSCILLATION OF DYNAMICAL SYSTEMS		96

Mathematics Genealogy Project

Students:

Click [here](#) to see the students ordered by family name.

Name	School	Year	Descendants
Kudryashova, Elena	St. Petersburg State University	2009	
Kudryashova, Elena	Jyväskylän yliopisto	2009	
Bragin, Vitaly	St. Petersburg State University	2010	
Vagaytsev, Vladimir	St. Petersburg State University	2010	
Vagaytsev, Vladimir	Jyväskylän yliopisto	2012	
Kiseleva, Maria	Jyväskylän yliopisto	2013	
Solovyeva, Elena	Jyväskylän yliopisto	2013	
Yuldashev, Marat	Jyväskylän yliopisto	2013	
Yuldashev, Marat	St. Petersburg State University	2013	
Yuldashev, Renat	Jyväskylän yliopisto	2013	1
Yuldashev, Renat	St. Petersburg State University	2013	1
Zaretskiy, Alexander	Jyväskylän yliopisto	2013	
Mokaev, Timur	St. Petersburg State University	2015	1
Aleksandrov, Konstantin	Jyväskylän yliopisto	2016	
Aleksandrov, Konstantin	St. Petersburg State University	2016	
Mokaev, Timur	Jyväskylän yliopisto	2016	1
Stankevich, Nataliya	Jyväskylän yliopisto	2017	
Mokaev, Ruslan	St. Petersburg State University	2018	
Mokaev, Ruslan	Jyväskylän yliopisto	2019	
Blagov, Mikhail	St. Petersburg State University	2020	
Blagov, Mikhail	Jyväskylän yliopisto	2021	
Zaitceva, Iuliia	St. Petersburg State University	2021	
Anikushin, Mikhail	St. Petersburg State University	2022	
Shoreh, Ahmed	St. Petersburg State University and Al-Azhar University	2022	
Alekseeva, Tatiana	Lappeenrannan teknillinen yliopisto	2024	
Lobachev, Mikhail	Lappeenrannan teknillinen yliopisto	2024	

Nikolay Kuznetsov

[MathSciNet](#)

Candidate of Science St. Petersburg State University 2004



Dissertation: *Stability of Discrete Systems*

Mathematics Subject Classification: 37—Dynamical systems and ergodic theory

Advisor 1: [Gennadii Alekseevich Leonov](#)

Ph.D. Jyväskylän yliopisto 2008



Dissertation: *Stability and Oscillations of Dynamical Systems: Theory and Applications*

Mathematics Subject Classification: 37—Dynamical systems and ergodic theory

Advisor 1: [Pekka Neittaanmäki](#)

Advisor 2: [Gennadii Alekseevich Leonov](#)

D.Sc. St. Petersburg State University 2016



Dissertation: *Analytical-numerical methods for the study of hidden oscillations*

Mathematics Subject Classification: 37—Dynamical systems and ergodic theory

Advisor 1: [Gennadii Alekseevich Leonov](#)

Results: The first Ph.D. SPBU defences

In 2013, the Department of Applied Cybernetics using its unique experience of the joint PhD program with the University of Jyväskylä organized the very first defences of PhD dissertations in the modern Russia (granted by SPBU instead of the Candidate of Sciences degrees granted by the state Higher Attestation Commission).



The defences of R. Yuldashev, M. Yuldashev and M. Kiseleva (with N.V. Kuznetsov, G.A. Leonov and P. Neittaanmäki as the scientific supervisors) took place on June 19, 2013, in the presence of Prof. Filippov, Chairman of the Higher Attestation Commission of the Russian Federation.

Results: The first Ph.D. degrees at SPBU

Supervisors

Dr. Nikolay V. Kuznetsov
Department of Applied Cybernetics
Faculty of Mathematics and Mechanics
Saint Petersburg State University, Russia,
Faculty of Information Technology
University of Jyväskylä, Finland

Professor Gennady A. Leonov
Member (corr.) of Russian Academy of Science,
Head of Department of Applied Cybernetics,
Dean of Faculty of Mathematics and Mechanics
Saint Petersburg State University, Russia

Professor Pekka Neittaanmäki
Department of Mathematical Information Technology
Dean of Faculty of Information Technology
University of Jyväskylä, Finland,
Honorary Doctor of Saint Petersburg State University

Opponents

Professor Alexey S. Matveev (Chairman)
Faculty of Mathematics and Mechanics
St. Petersburg State University, Russia,
Electrical & Electronic Engineering
and Telecommunications School
University of New South Wales, Australia

Professor Boris R. Andrievsky
Faculty of Mathematics and Mechanics
St. Petersburg State University, Russia,
Faculty of Information and Control Systems
Baltic State Technical University "VOENMEH", Russia

Professor Alexander K. Belyaev
Director of Institute of Applied Mathematics & Mechanics
St. Petersburg State Polytechnical University, Russia,
Vice-Director of Institute for Problems in Mechanical
Engineering Russian Academy of Sciences, Russia,
Honorary Doctor of University of Johannes Kepler, Austria

Professor Vladimir I. Nekorkin
Faculty of Radiophysics,
Lobachevsky State University of Nizhni Novgorod, Russia,
Head of Department of Nonlinear Dynamics
Institute of Applied Physics
Russian Academy of Sciences, Russia

Professor Sergei Yu. Pilyugin
Faculty of Mathematics and Mechanics
St. Petersburg State University, Russia

Professor Vladimir Rasv an
Faculty of Automatics, Computers and Electronics,
Director of Research Center
"Nonlinear control. Stability and oscillations"
University of Craiova, Romania

Professor Timo Tiihonen
Department of Mathematical Information Technology,
Vice-Dean of Faculty of Information Technology,
University of Jyväskylä, Finland

LIST OF INCLUDED ARTICLES

- PI R.E. Best, N.V. Kuznetsov, G.A. Leonov, M.V. Yuldashev, R.V. Yuldashev. Nonlinear Analysis of Phase-locked Loop Based Circuits. *Discontinuity and Complexity in Nonlinear Physical Systems (eds. J.T. Machado, D. Baleanu, A. Luo), Springer, [accepted]*, 2013.
- PII N.V. Kuznetsov, G.A. Leonov, S.M. Seledzhi, M.V. Yuldashev, R.V. Yuldashev. Nonlinear analysis of phase-locked loop with squarer. *IFAC Proceedings Volumes (IFAC-PapersOnline) (5th IFAC International Workshop on Periodic Control Systems, Caen, France) [accepted]*, 2013 [Scopus].
- PIII N.V. Kuznetsov, G.A. Leonov, P. Neittaanmäki, S.M. Seledzhi, M.V. Yuldashev, R.V. Yuldashev. Simulation of Phase-Locked Loops in Phase-Frequency Domain. *International Congress on Ultra Modern Telecommunications and Control Systems and Workshops, IEEE art. no. 6459692, pp. 351–356, 2012* [Scopus].
- PIV G.A. Leonov, N.V. Kuznetsov, M.V. Yuldashev, R.V. Yuldashev. Analytical Method for Computation of Phase-Detector Characteristic. *IEEE Transactions On Circuits And Systems—II: Express Briefs, Vol. 59, Iss. 10, pp. 633–637, 2012* [Scopus].
- PV G.A. Leonov, N.V. Kuznetsov, M.V. Yuldashev, R.V. Yuldashev. Computation of Phase Detector Characteristics in Synchronization Systems. *Doklady Mathematics, Vol. 84, No. 1, pp. 586–590, 2011* [Scopus].
- PVI N.V. Kuznetsov, G.A. Leonov, P. Neittaanmäki, S.M. Seledzhi, M.V. Yuldashev, R.V. Yuldashev. High-frequency Analysis Of Phase-locked Loop And Phase Detector Characteristic Computation. *Proceedings of the 8th International Conference on Informatics in Control, Automation and Robotics, Vol. 1, pp. 272–278, 2011* [Scopus].
- PVII N.V. Kuznetsov, G.A. Leonov, M.V. Yuldashev, R.V. Yuldashev. Analytical methods for computation of phase-detector characteristics and PLL design. *ISSCS 2011 - International Symposium on Signals, Circuits and Systems, Proceedings, pp. 1–4, IEEE press, 2011* [Scopus].
- PVIII N.V. Kuznetsov, G.A. Leonov, P. Neittaanmäki, S.M. Seledzhi, M.V. Yuldashev, R.V. Yuldashev. Nonlinear Analysis of Phase-Locked Loop. *Periodic Control Systems – PSYCO 2010 Antalya, Turkey, August 26–28, 2010 IFAC Proceedings Volumes (IFAC-PapersOnline), Vol. 4, No. 1, pp. 34–38, 2010.*

ISSN 2308-3476

1

 SAINT PETERSBURG STATE UNIVERSITY STUDIES
IN MATHEMATICS

Renat V. Yuldashev

 Nonlinear Analysis and
Synthesis of
Phase-Locked Loops


Results: Highly Cited Researchers (WoS) and Academic Ranking of World Universities

In the area of “Automation and Control”
 2018 - SPBU has the 32nd individual place - the best achievement of Russian universities in all years in all fields

In the Academic Ranking of World Universities Highly Cited Researchers (HiCi) has the same value as Fields medal and Nobel prize



Indicators and Weights for ARWU

Criteria	Indicator	Code	Weight
Quality of Education	Alumni of an institution winning Nobel Prizes and Fields Medals	Alumni	10%
Quality of Faculty	Staff of an institution winning Nobel Prizes and Fields Medals	Award	20%
	Highly Cited Researchers	HiCi	20%

Conclusion

An important factor in the unique long-term and productive cooperation was the geographical location of St. Petersburg and Finland and the development of the transport infrastructure in our country. This provided unique conditions for cooperation, in which participation in the programs did not require full-time interruption from studies or work at St. Petersburg University. This significantly distinguished our joint programs from similar university programs with other European universities, where participants had to suspend or completely interrupt their studies and work in Russia.

Highly qualified scientific personnel trained within the programs after completing the programs also defended dissertations in Russia, worked at St. Petersburg University, and made a significant contribution to the success of our scientific school.

The potential, we have accumulated at St. Petersburg University, will allow us to restore the ties frozen in recent years, if necessary. At the same time, new information and communication technologies and innovative administrative solutions may make it possible to effectively overcome geographical difficulties in organizing joint scientific and educational programs with world-famous universities.



РЕКТОРУ
САНКТ-ПЕТЕРБУРГСКОГО
ГОСУДАРСТВЕННОГО
УНИВЕРСИТЕТА
Н.М.КРОПАЧЕВУ

Уважаемый Николай Михайлович,

В связи с избранием заведующего кафедрой прикладной кибернетики Санкт-Петербургского государственного университета доктора физико-математических наук профессора Н.В.Кузнецова иностранным членом Финской академии науки и литературы хотел бы поздравить с этим профессора Н.В.Кузнецова и весь коллектив университета. Решение финского научного сообщества стало признанием заслуг ученых, работающих под Вашим руководством, в развитии сотрудничества между Россией и Финляндией в области науки и образования на благо дальнейшего укрепления традиционного добрососедства двух стран.

Посольство России в Финляндии со своей стороны готово и далее оказывать необходимую помощь в дальнейшем развитии многопланового взаимодействия СПбГУ с финскими партнерами.

№ 585
«20» октября 2020г.



Н.В.КУЗНЕЦОВ

Publications

- Abramovich S., Kuznetsov N., Razov A., G.A. Leonov: eminent scholar, admired teacher and unconventional administrator, Journal of Physics: Conference Series, Vol. 1864, 2021, 012066, <https://dx.doi.org/10.1088/1742-6596/1864/1/012066>
- A mathematician from St Petersburg University becomes the youngest external member of the Finnish Academy of Science and Letters, 23.09. 2020, <https://english.spbu.ru/news-events/news/mathematician-st-petersburg-university-becomes-youngest-external-member-finnish>
- St Petersburg University develops comprehensive academic programme in machine learning and artificial intelligence, 27 September 2023, <https://english.spbu.ru/news-events/news/st-petersburg-university-develops-comprehensive-academic-programme-machine-learning>
- Among the six Russian scientists included in the top most cited scientists in the world, there are three researchers from St Petersburg Univ., 16.12.2020, <https://english.spbu.ru/news-events/news/among-six-russian-scientists-included-top-most-cited-scientists-world-there-are>
- Supervisors manifest on the first Ph.D. SPBU, 10 July 2013, <https://apcyb.spbu.ru/wp-content/uploads/2013-First-PhD-SPbU-Renat-Yuldashev-Supervisors.pdf>
- Kiseleva M. (2013). Oscillations and Stability of Drilling Systems: Analytical and Numerical Methods. Saint Petersburg State University Studies in Mathematics, vol. 3. Video: https://vk.com/apcyb?z=video-220669694_456239022
- Blagov M. (2021). Exact lock-in range for classical phase-locked loops. JYU Dissertations, vol. 469. Video: https://vk.com/apcyb?z=video-220669694_456239024
- Keskiuomalainen, Kaksin verroin väitösjännitystä. Jyväskylän yliopisto: identtiset kaksoiset Marat ja Renat väittelevät tohtoreiksi perättäisinä päivinä, 17.12.2013, http://apcyb.spbu.ru/wp-content/uploads/Marat_Renat_Finnish_magazine.jpg
- Abramovich S. Integrating Scholarship and Service to the International Community, SUNY Potsdam - School of Education and Professional Studies Newsletter, Vol. XIV, 2012, 22-23
- Keskiuomalainen, Lahjakas ratkaisija. 24-vuotias tutkija Olga Kuznetsova teki vauvan ja väitöskirjan. 2011, <https://apcyb.spbu.ru/wp-content/uploads/2011-PhD-Jyu-Kuznetsova-2.jpg>
- Helsingin Sanomat, Yliopistojen tutkijakunta kansainvälistyy nopeasti. Olga Kuznetsova sukkuloi Pietarin ja Jyväskylän väliä. Hän väittelee tiistaina tohtoriksi. 15.11.2011
- Abramovich S. Serving an international community, SUNY Potsdam-School of Education and Professional Studies Newsletter, XI, 2009, 16-17
- Заседание УС Мат-мех факультета СПбГУ от 7.11.2024, https://spbu.ru/sites/default/files/2024-11/20241107_protocol_us_math.pdf

Contacts

Nikolay V. Kuznetsov

Professor, Head of the Department of Applied Cybernetics,
St. Petersburg University;

Head of the Laboratory of information and control systems,
the Institute for Problems in Mechanical Engineering
of the Russian Academy of Science;

Corr. member of the Russian Academy of Science

n.v.kuznetsov@spbu.ru, nkuznetsov239@mail.ru

<https://vk.com/apcyb>

<https://apcyb.spbu.ru/wp-content/uploads/2024-MathMech-SPbU-Finland.pdf>

