Ivane Javakhishvili Tbilisi State University
Faculty Exact and Natural Sciences
Department of Computer Sciences

Bachelor Program

Computer Science
კომპიუტერული მეცნიერება

Academic degree:
Bachelor of Informatics
ინფორმატიკის ბაკალავრი

Tbilisi
2018

Faculty	Faculty Exact and Natural Sciences
Program name	Computer Science
Program volume in credits	240 ECTS
Language of teaching	English
Academic degree awarded	Bachelor of Informatics
Prerequisite to access to the program	The Georgian citizens must pass Unified National Exams. Admission for the program requires minimal competence levels in following Unified National Exams: • English Language - 69% + 1 • General Aptitude – minimum competence levels is determined by National Assessment and Examinations Center • Georgian Language - minimum competence levels is determined by National Assessment and Examinations Center • Mathematics/Physics - minimum competence levels is determined by TSU faculty Exact and Natural Sciences Foreign applicants should follow the rules and terms defined by the Ministry of Education and Science of Georgia (http://www.mes.gov.ge/content.php?id=1131&lang=geo) according to the order №224/N of the Minister of Education and Science of Georgia (December 29, 2011). The Applicant should prove English language qualification equivalent to CEFR level B2 or higher.
Program Heads	Manana Khachidze Alexandre Gamkrelidze Gia Sirbiladze Koba GelaSvili (Full CV see in Appendix 1)
Program Coordinator	Magda Tsintsadze (Full CV see in Appendix 1)
Tution fee	3 500$ or 9000 GeL one academic year

Program Educational Objectives

The educational objectives of the undergraduate program "Computer Science" are to issue graduates who will

1. be productive, responsible computing science professionals conducting research and/or design developing and maintaining projects in the various areas of Computer Science,
2. understand and apply ethical issues and social aspects of computing science in performing their duties as computer science professionals,
3. continue the learning of new technologies in the computer science area through self-directed professional development or post-graduate education.

Student Outcomes

Department of Computer Sciences adopted ABET CAC Student outcomes:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

ABET CAC Student outcomes		**Knowledge and understanding**	**Skills**	**Autonomy and Responsibility**
1.	**Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.**			
2.	**Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.**			
3.	**Communicate effectively in a variety of professional contexts.**			
4.	**Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.**			
5.	**Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.**			
6.	**Apply computer science theory and software development fundamentals to produce computing-based solutions**			

Performance Indicators for Student Outcomes

Student Outcomes:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
   PI 1: Analyze a complex computing problem to identify a solution
   PI 2: Apply principles of computing to identify a solution to a complex computing problem
   PI 3: Apply principles of relevant disciplines to identify a solution to a complex computing problem

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
   PII1: Design a software solution to meet a given set of computing requirements
   PII2: Implement a software solution to meet a given set of computing requirements
   PII3: Evaluate a computing-based solution to meet a given set of computing requirements

3. Communicate effectively in a variety of professional contexts
   PIII1: Participate effectively in group discussions
   PIII2: Prepare an effective presentation
   PIII3: Write an effective project report

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
   PIV1: Recognize professional responsibilities in computing practice based on legal and ethical principles.
   PIV2: Make informed judgment in computing practice based on legal and ethical principles

5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
   PV1: Effectively engaged in team as member or leader
   PV2: Contributes effectively for common task

6. Apply computer science theory and software development fundamentals to produce computing-based solutions.
   PVI1: Apply computer Science theory to produce a solution
   PVI2: Apply software development fundamentals to produce a solution

Level Of Learning Achievement

- The learning outcomes are defined in the disciplines envisaged by the Bachelor Program of "Computer Science", which are taught in I-VIII semester. To reach this level means:

- Knowledge of fundamental principles and theories in computer science;

- Ability to use key and fundamental algorithms of computer science in different fields of science and practice;

- Ability to use modern programming languages and tools;
- Ability to operate and use different purpose tools of computer science and information technology.

Fields of Employment

Fields of employment of Bachelor of Computer Science are: Governance bodies, educational institutions and organizations of different forms of ownership which use computer technologies for their activities. Bachelor of computer science is predominantly prepared for the development and use of modern methods in the field of economy, management and financial activities. Bachelor of Computer Science can occupy any position that according to the laws of Georgia require higher education. The presented bachelor program takes care of graduates' employment, by means of providing opportunities for continues education, as well as by means of invited lectures participating in the program: most of them are representatives of big employers at Georgian labor market, their tight relationship with students increases the chance of employment of successful students with favorable conditions.

The Possibility To Continue Learning

Bachelor of Computer Science will be able to continue their study at master degree programs, such as "Computer Science", "Information systems", "Information technologies", which represent the extension of the undergraduate program. The graduates can continue their education also at master programs in mathematics, engineering, and other Natural Sciences those prerequisite are programming and mathematical knowledge.Major specialty choosing deadline

The third semester is the deadline for choosing major specialty (optimal is the second semester). If students change their mind, they will be able to continue learning at other bachelor programs being carried out at the faculty (mathematics, electronics).

Program Delivery Modes

The Computer Science program is offered as an on-campus day time program. Our academic year is divided into two semesters (fall and spring). Each semester 15 weeks of instruction, with the sixteenth week used for final examinations. The number of contact hours (lecture/practice/workshop/lab) correspond to 5 ECTS and usually meet for three 50-minute periods each week.

The required courses in computer science are offered in every semester, and the most of elective ones are offered at least once a year. Most undergraduate courses are offered during daytime.

There are three basic program delivery modes:

Lectures: verbal, problem-based learning (PBL), demonstration method, induction, deduction, analysis and synthesis.

Seminars, practical and laboratory teaching: verbal, book-based method, laboratory and demonstration methods, practical methods, induction methods, analysis method, and synthesis method, electronic attending (E-learning).

Team Projects: Verbal, PBL, E-learning, cooperative learning, collaborative work.

Grading scheme and grade distribution guidance

The student's knowledge is being evaluated according to the following system: "Excellent", "Very good", "Good", "Satisfactory", "Sufficient", "Marginal fail" and "Fail"
A student is evaluated in accordance with the following principle:

Scores	Evaluation	Classification of Evaluation	GPA of Evaluation
91% and more	(A) "Excellent"	Positive	4.0
81 -90%	(B) "Very good"	Positive	3.0
71 -80%	(C) "Good"	Positive	2.0
61 -70%	(D) "Satisfactory"	Positive	1.0
51 -60%	(E) "Sufficient"	Positive	0.5
41 -50%	(FX) "Marginal Fail"	Negative	0
40% and below	(F) "Fail"	Negative	0

The student's final mark in a specific subject is determined by the number of point collected by him/her in the different components (lecture, seminar, practical studies, laboratory exercises) in the course of interim and final (examination) evaluation.

The maximum a viable point in each course is 100. Final exam does not exceed 40 points, interim evaluation represents a combination of test scores, presentation in the class, and team or individual projects. The weight of each components are different for different course and are defined in syllabuses

Grading System of the CS Program is consistent with the TSU standard grading system:

Evaluation	Scores	GPA
A	91-100	4.0
B	81-90	3.0
C	71-80	2.0
D	61-70	1.0
E	51-60	0.5
F-FX	0-50	0.0

Curriculum

Full volume of 240 ECTS. from here:

135 ECTS - Computer Science subjects;
30 ECTS - Mathematical subjects;
30 ECTS - Natural Sciences subjects;
45 ECTS - General education.

Faculty: ***Faculty of Exact and Natural Sciences***
Institute / Department / Chair / Direction: Computer Sciences
Name of the Program: ***Computer Science***
Level of training: a bachelor
Heads of Program: Manana Khachidze, Aleksander Gamkrelidze, Gia Sirbiladze, Koba Gelashvili.
Coordinator: Magda Tsintsadze
Date of approval of the Academic Council, Resolution Number:
Date of the enrollment of the academic year (academic year): 2019-2020

	Course	Subject status	ECTS	hours	Lecture / Practice / Work / Lab	Prerequisite	I Semester	II Semester	III Semester	IV Semester	V Semester	V I Semester	VII Semester	VIII Semester
CS101	ICT Literacy	**R**	5	30/95	1/0/0/2	N/R								
CS102	Basics of Programming	**R**	5	45/80	1/1/0/1	N/R								
CS103	Introduction to Algorithms	**R**	5	60/65	2/2/0/0	N/R								
MaTh101	Calculus	**R**	5	60/65	2/2/0/0	N/R								
GE	Language 1(Georgian)	**R**	5	60/65	0/4/0/0	N/R								
SC	Elective Intr Sc.1	**SR**	5	60/65	2/2/0/0	N/R								
CS104	Object Oriented Programming 1 (C ++)	**R**	5	60/65	1/2/0/1	CS102								
CS105	Data Structures	**R**	5	45/80	1/1/0/1	CS103, CS102								
CS106	Algorithm Design	**R**	5	60/65	2/1/0/1	CS103								
MaTh102	Linear Algebra	**R**	5	60/65	2/2/0/0	N/R								
GE	Language 2(Georgian)	**R**	5	60/65	0/4/0/0	Language 1 (Gerogian)								
SC	Natural Sciences	**SR**	5											

CS201	Algorithms and Complexity	**R**	5	45/80	2/1/0/0	CS106									
CS202	CS202 Object Oriented Programming 2 CS212 Object Oriented Programming 2 (C#) or CS222 Object Oriented Programming 2 (Java) or CS232 Objec Oriented Programming 2 (VBA)		5		 1/2/0/0 2/0/0/1 1/1/0/1	CS104									
CS203	Computer Architecture and Organization	**R**	5	45/80	1/0/1/1	CS104									
MaTh201	Calculus for Computer Science	**R**	5	4580	2/2/0/0	MaTh101 MaTh102									
GE	General Education	**R**	5	60/65	0/4/0/0										
GE	General Education	**S**	5												
CS204	Data Base	**R**	5	60/65	1/0/1/2	CS104,									
CS205	Data Analysis and Statistics	**R**	5	60/65	1/0/2/1	MaTh201									
CS206	Mathematical Programing	**R**	5	45/80	1/2/0/0	MaTh201									
MaTh202	Discrete Mathematics	**R**	5	45/80	2/1/0/0	MaTh102									
SC	Natural Sciences	**SR**	5	60/65	2/00/2										
GE	General Education	**S**	5												
CS301	Operations Research	**R**	5	45/80	1/1/0/1	CS206									
CS302	Operating systems	**R**	5	45/80	1/0/1/1	CS104									
CS303	Modeling and Simulation	**R**	5	60/65	1/0/2/1	CS205									
CS	CS elective	**SR**	5												
SC	Natural Sciences	**SR**	5	60/65	2/00/2										
GE	General Education	**S**	5												
CS304	Web Technology	**R**	5	45/80	1/0/0/2	CS104									

CS305	Network Technologies and Communications	**R**	5	45/80	1/0/1/1	CS302								
Math-el1	MATH- elective 1	**SR**	5											
CS	CS elective	**SR**	5											
CS	CS elective	**SR**	5											
GE	General Education	**S**	5											
CS401	Software Engineering	**R**	5	30/95	1/0/1/0	CS202								
CS402	Project Preparation	**R**	5	30/95	1/0/1/0	165 ECTS								
CSEL	CS elective	**SR**	5											
MaThEl	MATH- elective 2	**SR**	5											
GE	General Education	**S**	5											
SC	Natural Sciences	**SR**	5											
CS403	Intelligent Systems	**R**	5	45/80	1/0/1/1	CS201, CS104								
CS404	Computer law and Ethics	**R**	5	30/95	1/0/1/0									
CS405	Team Projects	**R**	5	30/95	0/0/2/0	CS401, CS402								
CSEL	CS elective	**SR**	5											
SC	Natural Sciences	**SR**	5											
GE	General Education	**S**	5											
							30	**30**	**30**	**30**	**30**	**30**	**30**	**30**

Elective Cources

	Course	Subject status	ECTS	hours	Lecture / Practice / Work / Lab	Prerequisite	I Semester	II Semester	III Semester	IV Semester	V Semester	V I Semester	VII Semester	VIII Semester
Natural Sciences Courses														
Ph101	Introductory Physics	SR	5	60/65	2/2/0/0	N/R								
Che101	Introduction to Chemistry	SR	5	45/80	2/0/1/0	N/R								
Bio101	Introduction to Biology	SR	5	60/65	2/0/2/0	N/R								
Geo101	Introduction to Geography	SR	5	60/65	2/2/0/0	N/R								

Geol101	Introduction to Geology	SR	5	60/65	2/2/0/0	N/R								
Bio501	Genetics and Molecular Biology	SR	5	60/65	2/0/0/2	N/R								
Bio502	Human and Animal Physiology	SR	5	60/65	2/0/0/2	Bio101								
Bio503	Food and Health	SR	5	60/65	2/1/1/0	Bio101								
Geo501	Biogeography	SR	5	45/80	1/0/2/0	Geo101								
Geo502	Hydrology	SR	5	45/80	1/2/0/0	Geo101								
Ph501	Mechanics	SR	7	120/55	3/2/0/3	Ph101								
Ph502	Electromagnetism	SR	7	120/55	3/2/0/3	Ph501								
Mathematical subjects														
Math501	Mathematical analysis 1	SR	5	45/80	1/2/0/0	Math101								
Math502	Basic course of Probability and Statistics	SR	5	45/80	1/2/0/0	Marth101, Math102								
Math503	Numerical Analysis	SR	5	45/80	1/2/0/0	Marth101, Math102								
Math504	Technologies of Mathematical Modeling	SR	5	45/80	1/2/0/0	Math503								
General Education														
GE101	Georgian Language for Foreigners 1	**R**	5	60/65	0/4/0/0	N/R								
GE102	Georgian Language for Foreigners 2	**R**	5	60/65	0/4/0/0	GE101								
GE501	Georgian Language for Foreigners 3	**S**	5	60/65	0/4/0/0	GE102								
GE502	Foundations of British Studies	**S**	5	30/95	1/0/1/0	N/R								
GE503	Georgian Mythology	**S**	5	45/80	2/0/1/0	N/R								
GE504	Practicum in Sociolinguistics	**S**	5	45/80	1/0/2/0	N/R								
GE506	Public Speaking	**S**	5	45/80	1/0/2/0	N/R								
GE507	Introduction to Psychology	**S**	5	60/65	2/0/2/0	N/R								
GE508	Principles of Macroeconomics	**S**	5	45/80	1/0/2/0	N/R								
GE509	Principles of Microeconomics	**S**	5	45/80	1/0/2/0	N/R								
Computer Science Elective courses														
CS501	Algorithmic Information Theory	**SR**	5	30/95	1/1/0/0	CS102, CS105, CS106								
CS502	Algorithms for Computational Topology	**SR**	5	30/95	1/1/0/0	CS102, CS105,								

						CS106								
CS503	Introduction to Complexity Theory	**SR**	5	30/95	1/1/0/0	CS102, CS105, CS106								
CS505	Functional Programming using Haskell	**SR**	5	45/80	1/1/0/1	N/R								
CS506	ADO.NET technology - data access from NET application	**SR**	5	30/95	1/1/0/0	CS212, CS204								
CS508	Advanced course of Algorithms	**SR**	5	45/80	1/0/0/2	CS104 (71 points or more), CS105, CS106								
CS510	Programming with Java (Advanced Course)	**SR**	5	45/80	2/0/0/1	CS204, CS222 (minimal score of 60 poins)								
CS511	Information Management	**SR**	5	45/80	2/0/1/0	CS101								
CS512	Formal Languages and Finite Automats	**SR**	5	45/80	1/2/0/0	CS102, CS103								
CS513	Genetic Algorithms	**SR**	5	45/80	1/1/0/1	CS102, CS106								
CS514	Neural Networks	**SR**	5	45/80	1/1/0/1	CS102, CS106								
CS515	Behavioral models of discrete systems	**SR**	5	45/80	1/2/0/0	CS205								
CS516	The Technologies of the Information Security	**SR**	5	45/80	1/1/1/0	CS102, CS103								
CS517	Cryptographic Algorithms	**SR**	5	45/80	1/1/1/0	MaTh202								
CS518	Information Theory and Coding	**SR**	5	45/80	1/2/0/0	MaTh202								
CS 519	Information Models and Systems	**SR**	5	45/80	1/0/1/1	CS105								
CS520	Network Technologies and Communications 2	**SR**	5	45/80	1/0/0/2	CS305								
CS521	Operating System Linux for Servers	**SR**	5	45/80	1/0/0/2	CS302								

CS Program Course Mapping to Program SLOs.

CS Program Courses	**PI 1**			**PI 2**			**PI 3**			**PI 4**		**PI 5**		**PI 6**	
	P1.1	**P1.2**	**P1.3**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**	**P4.1**	**P4.2**	**P5.1**	**P5.2**	**P6.1**	**P6.2**
CS 101 ICT Literacy								**L**	**L**	**L**					
CS 102 Basics of Programming	**L**	**L**			**L**									**L**	

CS 103-Introduction to Algorithms	**L**	**L**				**L**	**L**						**L**		**L**
CS 104 Objects Oriented Programming 1 (C ++)	**M**			**M**	**L**									**L**	**L**
CS 105 Data Structures	**L**		**L**	**L**	**L**		**M**								
CS 106 Algorithm Design	**L**	**L**		**M**			**M**	**M**				**M**			
CS 201- Algorithms and Complexity	**M**	**L**					**M**	**M**					**M**		**M**
CS 202(2012, 222, 232) Objects Oriented Programming 2 (Java, C#, VBA)	**H**	**H**		**M**	**M**	**H**								**H**	**M**
CS 203-Computer Architecture and Organization	**M**			**M**	**M**	**M**	**M**		**M**						
CS 204 Data Base	**H**			**M**	**H**	**M**			**M**			**H**			
CS 205 Data Analysis and Statistics	**H**			**M**	**M**	**M**	**M**	**M**							**M**
CS206- Mathematical Programming	**H**			**M**	**H**									**M**	
CS 301 Operations Research	**H**			**H**	**H**									**H**	
CS 302 Operating systems	**H**		**M**	**H**		**H**		**H**				**H**			

CS 303 Modeling and Simulation	**M**	**H**		**H**	**H**	**H**	**H**	**H**				**H**			**H**
CS 304 Web Technology		**H**		**H**	**H**	**M**								**H**	**H**
CS 305 Network Technologies and Communications	**H**	**M**		**M**	**H**	**M**	**L**		**H**					**H**	**H**
CS 401 Software Engineering	**H**			**H**	**H**	**H**	**H**							**H**	**H**
CS 402 Project Preparation			**H**				**H**	**H**		**H**	**H**	**H**	**H**		
CS 403 Intelligent Systems	**H**			**H**	**H**	**H**									
CS 404 Computer law and Ethics										**H**	**H**				
CS 405 Team Projects		**H**	**H**	**H**	**H**		**H**	**H**	**H**		**H**	**H**	**H**	**H**	**H**

H- High
M - Middle
L – Low

Necessary auxiliary conditions /resources for learning

The Department of Computer Science has nine open labs for students (rooms 407-415 and 417-419 in XI building) and one computer Lab (room 409) with Sisco research equipment. Open labs can be used by all university students including computer science students. There are 250 pieces of hardware including computers, projectors and printers in the department inventory list. Following is a list of the hardware and software in each open lab:

Room 407
Windows – 16 machines
Room 408
Windows – 16 machines
Room 409
Windows – 16 machines
Room 410
Windows - 16 machines
Room 411
Windows – 24 machines
Room 412-413
Windows – 31 machines
Room 414-415
Windows – 31 machines
Room 417
Windows – 16 machines
Room 418
Windows – 16 machines
Room 419
Windows – 16 machines

Overall 198 computers.

The following programs are running on all computers:

- **Operating systems Windows7 or Windows 10**
- **Operating system Linux;**
- **Windows Server 2016;**
- **Microsoft Office 2013, Office 2016;**
- **Visual Studio 2015, 2017;**
- **SQL Server 2012;**
- **Adobe Photoshop CS5;**
- **Adobe Dreamviewer;**
- **WAMP;**
- **Sublime;**
- **MATLAB;**
- **MATLAB & Simulink;**
- **WMware Workstation;**
- **Wolfram Mathematic 11;**
- **Microsoft Azure;**
- **Emu8086;**
- **Little Man Computer;**
- **CPU emulator;**
- **GNS3;**
- **Cisco Packet Tracer;**
- **Virtual Box 5.0;**
- **Sublime Text;**
- **Vamp Server;**
- **SPSS 20;**
- **Wire shark;**
- **Code::Blocks**
- **Shadow Defender;**
- **WinRAR;**
- **Adobe Reader.**

Appendix 1

Program Heads CV

Manana Khachidze

Education

- Master's degree (equal) in Mathematical software of ACS, Tiblisi State University, Faculty of Cybernetic and Applied Mathematic , 1982-1987.
- Doctor (PhD - Technological Science), Academic doctor (equal), Candidate of Technical Sciences. Georgian Technological University,1998.

Academic experience

- I.Javakhishvili Tbilisi State University; Faculty of Exact and Natural Sciences, Computer Sciences Department, Professor, head of department, 2006 – up now, full time;
- I.Javakhishvili Tbilisi State University; Faculty of Applied Mathematics and Computer Science, Senior ticher, 1999-2006, part time.

Non-academic experience

- A.Eliashvili Institute of Control Systems, Department of Machine Intelligence Problems; Senior scientist, 1988 -2010, full time (1988-20060, part time (2006-2010);
- Rescue-Guide Service of Georgia Tourism Department, Information Department, Head, 2000 – 2003, part time;
- Georgian Academy of Sciences, journal "Metsniereba da teqnika" (Science and Technology), IT Department, Head, 1993-1998 , part time.

Current membership in professional organizations

- Member of the TSU Senate (since 2010);
- Member of Georgian Academy of Natural Sciences;
- Adviser of Georgian Academy of Engineering;
- Board Member of Georgian Speleologists Union;
- Fellow of LEAD International (International Program - Leadership for Environment and Development) (1996-1998), www.lead.org.
- ACM (Association for Computing Machinery) Professional Membership

Service activities

- Accreditation and authorization expert of National Center for Educational Quality Enhancement Georgia (since 2010);
- Supervisor for master degree's students;
- Member of master degree certification commission;
- Reviewer of master thesis.

Briefly list the most important publications and presentations from the past five years

- M. Khachidze, M.Tsintsadze, M. Archuadze, G. Besiashvili. Complex system state generalized presentation based on concepts. Application of Information and Communication Technologies (AICT), 2014 IEEE 8th International Conference on, At Astana. DOI: 10.1109/ICAICT.2014.7035999
- M.khachidze, G.Besiashvili. Pollution and Pollutin Source Definition on the Basis of Data Conceptual Analysis. International Conference "TBILISI-SPRING-2014" - Nuclear Radiation Nanosensors and Nanosensory Systems.
- M.khachidze, G.Besiashvili, M. Archuadze, M.Cincadze. Sensor data Full Application Circle Planning International Conference "TBILISI-SPRING-2014-Nuclear Radiation Nanosensors and Nanosensory Systems. 2014
- T.Tatrishvili, N.Jalagonia, K. Gelashvili, M.Khachidze, E.Markarashvili, J.Aneli, O.Mukbaniani. Quantum Chemical calculations of Hydrosilytation Reaction of Oligomethylhydrosiloxane to Allyl Cyanide and Polymer Electrolyte Membranes on their Basis. Oxidation Communications 38, No1, 2015. pp. 13-24.
- M.khachidze, M.Tsintsadze, M. Archuadze, G.Besiashvili. Concept Pattern Based Text Classification System Development for Georgian Text Based Information Retrieval. Baltic J. Modern Computing, Vol. 3 (2015), No. 4, pp. 307–317.
- P.J. Kervalishvili, M. G. Khachidze, A. Chirakadze. Novel Achievements in Information Science and Technology as basis of Secure Society Sustainable Development. Series:NATO Science for Peace and Security Series - E: Human and Societal Dynamics. Ebook: Volume 120: Engaging the Public to Fight the Consequences of Terrorism and Disasters. 2015. pp. 27-39.
- P.J. Kervalishvili, M.G. Khachidze. Quantum Approach to Sensory Information Processing for Modeling of Disasters. Book - NATO Science for Peace and Security, Series B: Physics and Biophysics. Nuclear Radiation Nanosensors and Nanosensory Systems. 2016, pp.1-8.
- M.khachidze, M.Tsintsadze, M. Archuadze. Natural Language Processing (NLP) Based Instrument for Classification of Free Text Medical Records. BioMed Research International. Volume 2016 (2016), Article ID 8313454, 10 pages. http://dx.doi.org/10.1155/2016/8313454

Briefly list the most recent professional development activities

- 2016 - I.Javakhishvili Tbilisi State University. Document Classification Engine Model for Georgian Information. Supervisor.
- 2015.03 – 2015.12 - I.Javakhishvili Tbilisi State University. Georgian Documents Classification Methods. Supervisor
- 2009 –2010 - NATO "Science for Peace and Security", HSD.EAP.CLG. 983694. "Information, Synergy and Security". Team Leader.
- 2009-2011. GNSF, # 1-7/73; Creation of Modeling Software of Molecular Systems – Materials of Molecular Nanotechnology and Spin electronic. Coordinator.
- 2005-2006, INTAS Nr 04-77-7067. Medical Image processing – Theoretical Bases and Technological Aspects. Team Leader.
- Participation in Erasmus+ Program
- "Mobility For Double Diploma" - Erasmus+ - International Credit Mobility. Polytechnic Institute of Bragança (IPB), Portugal, 28 February – 12 March 2016.

- International Week for Academic and Administrative Staff. Bialystok University of Technology , 15 -19 May 2017, Białystok, Poland.
- Academic and Administrative Staff mobility. 14-16 June, 2017. INSA Rennes, member of the INSA Group, France

Alexander Gamkrelidze

Education

1997: Diplom (Masters) in Computer Science, Saarland University, Germany

2001: Doktor der Ingenieurwissenschaften (Informatik), Saarland University, Germany

Academic experience

- 1992 – 1996, PT: Student scientist (HiWi) at the university of Saarland, supported by the Deutsche Forschungsgemeinschaft, DFG. Computer Science Department, Saarland University, Germany
- 1997- 1999, FT: Member of the scientific staff, Computer Science Department, Saarland University, Germany
- 2000 – 2001, PT: Researcher, AG IV (Logic), Max-Planck Institute for Informatics, Saarbrücken, Germany
- 2002 – 2006 PT: Member of the scientific staff I. Vekua Institute of Applied Mathematics, I. Javakhishvili Tbilisi State University
- 2002 – 2005 PT: Lecturer, Faculty of Mathematics, I. Javakhishvili Tbilisi State University
- 2006 – 2008 FT: Assistant Professor Faculty of Exact and Natural Sciences,
- Computer Science Departmant, I. Javakhishvili Tbilisi State University;
- Since 2008 FT: Full Professor, Faculty of Exact and Natural Sciences, Computer Sciences Departmant, I. Javakhishvili Tbilisi State University.

Honors and awards

2001: International Max-Planck Research School, Fellowship

Service activities

- Member, board of the faculty of Exact and Natural Sciences
- Co-author, Bachelor program in CS
- Co-author, Masters program in CS

Briefly list the most important publications and presentations from the past five years

- M. Bakuradze, A. Gamkrelidze, J. Gubeladze, Affine hom-complexes, Portugaliae Mathematica, Volume 73, Issue 3, pp. 183–205, 2016
- Gamkrelidze, G. Hotz, L. Varamashvili, New Invariants for the Graph Isomorphism Problem
- Journal of Mathematical Sciences, November 2016, Volume 218, Issue 6, pp 754–761, 2016
- L. Ephremidze, A. Gamkrelidze, E. Lagvilava, Daubechies wavelet matrices by perfect reconstruction filter banks with rational coefficients, Advances in Computational Mathematics, Springer Verlag, Volume 38, Issue 1, pp 147–158, 2013
- Gamkrelidze, Algorithms for low-dimensional topology, Journal of Mathematical Sciences, Springer Verlag, Volume 193, Issue 3, pp 433–448, 2013

Briefly list the most recent professional development activities

- 2012 – 2014: Shota Rustaveli Science Foundation, AR/340/2-105/11, Bilingual (Georgian-English) Electronic Encyclopedia of Georgian Archeological Monuments. III – I Millenium B.C. Participant: Development of the database, search engine and Web interface, 2013 – 2015;
- 2013 – 2015: Shota Rustaveli Science Foundation, DI/16/5-103/12. Convex topology: Categorial and Algorithmic Study of Polytopes, Manager;
- 2010 – 2013: Saarland University, Germany. Efficient Algorithms for the Graph Isomorphism Problem, Principal Investigator

Koba Gelashvili

Education

Doctor of Sciences in Mathematics , Mathematical Cybernetics, Tbilisi State University, Tbilisi, Georgia. 2003. Ph.D

Candidate of Fhysical and Mathematical Sciences. Tbilisi State University, Tbilisi, Georgia. 1993

MSc Applied Mathematics and Cybernetics. Tbilisi State University, Tbilisi, Georgia. 1982

Academic experience

- Iv.Javakhishvili Tbilisi State University (TSU), Department of Computer Sciences, Professor 2014-present
- TSU, Specialist 2012-2014
- TSU, Department of Computer Sciences, Professor 2006-2012
- TSU, Faculty of Applied Mathematics and Computer Sciences, Professor 2004-2006
- TSU, Faculty of Applied Mathematics and Computer Sciences, Associate Professor 1996-2004
- TSU, Faculty of Applied Mathematics and Computer Sciences, Senior Lecturer 1994-1996
- TSU, Tbilisi, Faculty of Cybernetics and Applied Mathematics, Lecturer 1982-1994

Certifications or professional registrations

English classes - Cambridge First Certificate

Current membership in professional organizations

SIAM, ACM

Service activities

- Curriculum: coordinator of bachelor program “Computer Science”;
- Curriculum: co-supervisor of master program “Computer Science”.

Briefly list the most important publications and presentations from the past five years

- On the modification of heavy ball method. Proc. A. Razmadze Math. Inst. 161 (2013), 83-95 (with L. Alkhazishvili, I. Khutsishvili, N. Ananiaishvili)
- Temporalized Structure of Bodies of Evidence in the Multi-Criteria Decision-Making Model. International Journal of Information Technology & Decision Making Vol. 14, 1-32 (2015) (with Gia Sirbiladze, Irina Khutsishvili and Anna Sikharulidze)
- Unconstrained minimization test functions collection, implemented in C++ . FENS eprints - http://eprints.tsu.ge/234/ (with Irina Khutsishvili, Papuna Qarchava), 2015

- The modification of the Sedgewick's balancing algorithm. Bulletin of the Georgian ACADEMY of SCIENCES, vol. 10, no. 3, 2016, 60-67 (with N. Grdzelidze, G. Shvelidze)
- Jagged non-zero submatrix data structure, Transactions of A. Razmadze Mathematical Institute (2017), https://doi.org/10.1016/j.trmi.2017.10.002 (with G. Chalauri, V. Laluashvili)

Gia Sirbiladze

Education

- 2005 - N. Muskhelishvili Institute of Computational Mathematics of Georgian Academy of Sciences, Tbilisi, Georgia, Doctor of Phys. Math. Sci (Probability Theory and Statistics).
- 1990 -Institute of Applied Mathematics of Georgian Academy of Sciences, Tbilisi, Georgia, Ph. D. (Computational Mathematics).
- 1981 - Tbilisi State University, Tbilisi, Georgia. Faculty of Applied Mathematics and Cybernetics. Diploma in Applied Mathematics and Cybernetics

Academic experience

- 2005-present Iv.Javakhishvili Tbilisi State University, Tbilisi, Georgia, Full Professor, Faculty of Exact and natural Sciences, Department of Computer Sciences. Chair if Applied Informatics
- 1994-2005 Tbilisi State University, Tbilisi, Georgia, Professor, Faculty of Applied Mathematics and Computer Sciences, Chair of Random Processes Theory.
- 1981-1994 Tbilisi State University Tbilisi, Georgia, Docent, Faculty of Applied Mathematics and Computer Science, Chair of Random Processes Theory.

Certifications or professional registrations

- N. Muskhelishvili Institute of Computational Mathematics of Georgian Academy of Sciences, Tbilisi, Georgia, Doctor of Phys. Math. Sci (Probability Theory and Statistics), 2005.
- Institute of Applied Mathematics of Georgian Academy of Sciences, Tbilisi, Georgia, Ph. D. (Computational Mathematics), 1993.

Current membership in professional organizations

- Member of International Society for the Systems Sciences; member of International Society of Multi Criteria Decision Making;
- World Scientific and Engineering Academy and Society – Fuzzy Systems Program Committee and others.

Honors and awards

The Order of Honor, N 07122

Service activities

- Chair of Applied Informatics at the Department of Computer Sciences;
- Coordinator of the Bachelor Program of Computer Science;
- Head of the Master Program of Information Systems;
- Head of the PHD Program of Computer Science

Briefly list the most important publications and presentations from the past five years

- Gia Sirbiladze, Extremal Fuzzy Dynamic Systems. Theory and Applications. IFSR International Series on Systems Science and Engineering, Springer, New York-Heidelberg- Dordrecht- London, 422 p.28, 2013.
- 2. G. Sirbiladze, I. Khutsishvili and B. Ghvaberidze, Multistage decision-making fuzzy methodology for optimal investments based on experts' evaluations, European Journal of Operational Research, Elsevier pub., 232, 2014, 169–177.
- Sirbiladze, B. Ghvaberidze, B. Matsaberidze, Bicriteria Fuzzy Vehicle Routing Problem for Extreme Environment. Bulletin of the Georgian National Academy of Sciences, vol. 8, no. 2, 41-48, 2014.
- G.Sirbiladze, K. Gelashvili, I. Khutsishvili and A. Sikharulidze, Temporalized Structure of Bodies of Evidence in the Multi-Criteria Decision-Making Model, International Journal of Information Technology & Decision Making, Vol. 14, No. 03, pp. 565-596, 2015.
- Sirbiladze, New Fuzzy Aggregation Operators Based on the Finite Choquet Integral — Application in the MADM Problem, International Journal of Information Technology & Decision Making 15(3) (2016) 517-551.
- Sirbiladze, O. Badagadze, Intuitionistic Fuzzy Probabilistic Aggregation Operators Based on the Choquet Integral: Application in Multicriteria Decision-Making, International Journal of Information Technology & Decision Making, 2017, Vol. 16, No. 01 : pp. 245-279.
- Sirbiladze, B. Ghvaberidze, B. Matsaberidze and A.Sikharulidze, Multi-Objective Emergency Service Facility Location Problem Based on Fuzzy TOPSIS, Bulletin of the Georgian National Academy of Sciences, 11(1), 23-30, 2017.
- Roberto Santana, Gia Sirbiladze, Bezhan Ghvaberidze And Bidzina Matsaberidze, A Comparison Of Probabilistic-Based Optimization Approaches For Vehicle Routing Problems, 2017 ieee congress on evolutionary computation (cec), ieee xplore, 2017, 2606-2613.
- Gia Sirbiladze, Irina Khutsishvili, Otar Badagadze and Gvantsa Tsulaia, Associated Probability Intuitionistic Fuzzy Weighted Operators in Business Start-up Decision Making, Iranian Journal of Fuzzy Systems, 2018 (accepted).
- Roberto Santana, Gia Sirbiladze, Bezhan Ghvaberidze and Bidzina Matsaberidze, A comparison of probabilistic-based optimization approaches for vehicle routing problems, 2017 IEEE Congress on Evolutionary Computation (CEC), IEEE Xplore, 2017, 2606-2613.
- Gia Sirbiladze, Anna Sikharulidze, Extentions of Probability Intuitionistic Fuzzy Aggregation Operators in Fuzzy Environmet, International Journal of Information Technology & Decision Making, 2018, (accepted).
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Briefly list the most recent professional development activities

- Scientific topics: Systems science and engineering; Computational intelligence; Evolutionary programming (genetic algorithms, estimation of distribution algorithms, hybrid algorithms) in the modeling of complex systems; Extreme fuzzy dynamic systems - control, filtration, identification and prediction.
- 2.Working on large scale software implementation and software architecture definition of scientific project.
- Participating in scientific projects as a project management or scientific researcher.

Magda Tsintsadze

Education

Candidate of Phys-math Sciences (Math.Cybernetics), TSU, Georgia, 2006
Post-Doctoral research, ATEI of Thessaloniki, Computer Science, Greece, 2008-2009

Academic experience

- 2017-current: San Diego State University Georgia, Invited Professor (part time)
- 2009- to present : Associate Professor at Iv. Javakhishvili Tbilisi State University/ Department of Exact and Natural Sciences (Full Time)
- 2015: Invited Lecturer for summer course teaching - The University of A Coruña, Spain
- 2014: Invited Lecturer for short course teaching (graduate level) Department of Computer Sciences (Infogeolog), Lodz University, Poland
- 2011-2012: Faculty-associate at Computer Science Graduate School of SUNY Stony Brook, NY, USA
- 2010-2011 – New Gelati American Academy - Invited lecturer for Calculus and Elementary Mathematics; Part Time
- 2006-2009: Assistant Professor at Iv. Javakhishvili Tbilisi State University/ Department of Exact and Natural Sciences
- 2005, 2006(June-August) – Dortmund University/ Faculty of Informatics -Guest Scientist (PhD fellow)

Non-academic experience

The Parliament of Georgia Senior Specialist at the Department of Informatics, 2002- 2009, Full Time

Certifications or professional registrations

- Certificate in Web Designing (Shriram Institute of Business and Information Technologies, New Delhi, India)
- Certificate -English language for Academic Purposes – CELOP, Boston University, USA

Current membership in professional organizations

Affiliate Member of AMS, Member of ACM and AAAI

Honors and awards

- 2005- INTAS Grant for YS
- 2008- President Grant for Young Scientists
- 2008-2009: Erasmus Mundus Post-Doctoral Fellowship grant
- 2011-2012 - Fulbright Faculty development Grantee
- 2014- Poland Scientific Foundation Grantee ((POLK-04,03.00-00-050/12)
- 2015-Georgisn High Education Component (MCC/MCA/San Diego)
- 2013-2016 - Shota Rustaveli National Foundation Grant for Fundamental Research (Key

Researcher

- 2015-2016 - Shota Rustaveli National Foundation Grant for Summer School (Main Personnel)

Service activities

- 2017- current : Abet Accreditation Team Member (Coordinator)
- 2016 - Iv.Javakhishvili Tbilisi State University. Document Classification Engine Model for Georgian Information. Coordinator.
- 2015.03 – 2015.12 - Iv.Javakhishvili Tbilisi State University. Georgian Documents Classification Methods. Coordinator
- Reviewer - Current Journal of Applied Science and Technology , Asian Journal of research in Computer Science, editorial board member of "The research Journal of Compputer Science and Information Technology"
- Supervisor for master degree's students;
- Member of master degree certification commission;
- Reviewer of master thesis.

Briefly list the most important publications and presentations from the past five years

- M.Tsintsadze - "Shapely Entropy Generalization for Fuzzy Measures Used in Uncertain Information Presentation", CEWIT 2013, SUNY Stony Brook
- M.Khachidze, M.Tsintsadze, M. Archuadze, G. Besiashvili. Complex system state generalized presentation based on concepts. Application of Information and Communication Technologies (AICT), 2014 IEEE 8th International Conference on, At Astana. DOI: 10.1109/ICAICT.2014.7035999
- Magda Tsintsadze , Nana Odishelidze - On one contact problem of plane elasticity theory with partially unknown boundary- PAMM Volume 15, Issue 1, October 2015, Pages: 235–236, DOI: 10.1002/pamm.201510108
- M.Khachidze, M.Tsintsadze, M. Archuadze. Natural Language Processing (NLP) Based Instrument for Classification of Free Text Medical Records. BioMed Research International. Volume 2016 (2016), Article ID 8313454, 10 pages. http://dx.doi.org/10.1155/2016/8313454

Briefly list the most recent professional development activities

- 2017: Participation in Erasmus+ Program : Academic and Administrative Staff mobility. INSA Rennes, member of the INSA Group, France
- 2015: Invited Lecturer for summer course teaching - The University of A Coruña, Spain
- 2015: Fellow – Volunteer at San Diego State University , USA
- 2014: Invited Lecturer for short course teaching (graduate level) Department of Computer Sciences (Infogeolog), Lodz University, Poland
- 2011-2012: Faculty-associate at Computer Science Graduate School of SUNY Stony Brook, NY, USA