TECHNION | The Henry and Marilyn Taub Faculty of Computer Science

The Henry and Marilyn Taub Faculty of Computer Science

Technion- Israel Institute of Technology

Graduate Studies Program Catalog
2025-2026

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1. Introduction

This booklet aims at guiding the students in The Faculty of Computer Science of computer science for the degrees of M.Sc. and All the rules in this booklet are subject to the regulations of the School of Graduate Studies, as listed in the studies catalog of the Technion. In case of differences between the Hebrew and English versions of this catalog, the Hebrew version shall apply.

The booklet lists the admission requirements and curriculum for M.Sc. and Ph.D. studies, the list of faculty members and their research areas, as well as division into research areas.

The graduate studies catalogue of The Faculty of Computer Science is also available on the Internet site of the Faculty: **graduate.cs.technion.ac.il/en/graduate-studies**. The site also includes detailed information (in Hebrew and English) on the Faculty, courses and syllabi, theses submitted in recent years, and other relevant information. It is also advisable to contact the Graduate Studies coordinator in the Faculty:
Anna Kleiner, in room 503, tel. 073-3784226, or by email: akleiner@cs.technion.ac.il

2. Study and Research Areas

The Faculty of Computer Science offers study programs for the degrees of “Master in Science in Computer Science", “Master in Science” and “Doctor of Philosophy”. Excellent students can apply for transfer to the Direct Ph.D. Track during their graduate studies.

The expertise and research areas of the Faculty are:

Theory of Computer Science:
Automata and Formal Languages
Coding
Complexity
Computational Geometry
Cryptology
Distributed Computing
Logic and Semantics
Theory of Algorithms

Systems:
Databases & Data Mining
Distributed & Parallel Systems
Hardware and Computer Architecture
Networks, Communication & Systems
Programming languages
Operating Systems & Virtualization
Software & Hardware verification
Software Engineering
Storage
System Security

Artificial Intelligence:
Learning
Reasoning

Intelligent Systems and Scientific Computation:
Geometric Modeling
Graphics
Image Processing and Computer Vision
Robotics and Complex Systems

Scientific Computation and Numerical Algorithms

Interdisciplinary Research:
Bioinformatics (Computer Science and Biology)
Computational Linguistics and Natural Language Processing
Quantum Information Processing (Computer Science, Electrical Engineering, Physics and Chemistry)
World Wide Web, Electronic Commerce, and Computational Finance

In addition to the theoretic research in these areas, the Faculty has research laboratories in the following areas:

Robotics
Computer Vision
Artificial Intelligence
Geometric Processing
Computer Graphics and Geometric Planning
Computer Communication Networks
Software Systems
Computer Systems
Natural Language Processing
Cyber and Computer Security
Learning and Reasoning
Data and Knowledge
Information Storage and Memories
Bioinformatics
Quantum Information Processing

3. M.Sc. Studies

The Faculty of Computer Science offers a study program for the degree of “Master of Science in Computer Science”. The studies are open for graduates of B.Sc. in Computer Science or other fields. The Faculty also offers a study program for the degree of “Master of Science” for graduates of B.Sc., which is not in computer science (such as Mathematics, Physics, and Electrical Engineering).

3.1 Admission Requirements

3.1.1 Admission Requirements for the Master in Computer Science Program

Students who have graduated with a B.Sc. degree in Computer Science, or in any of the joint tracks of Computer Science and other Faculties (e.g., Computer Engineering, Computer Science-Mathematics), may be admitted. Candidates who received their B.Sc. in another framework will be required to take supplementary courses as detailed below. Professional achievements of candidates with experience in industry or experience in research, as well as recommendation letters, will be taken into account by the Admissions Committee.

Candidates who wish to improve their academic standing towards admission may do so by taking courses as 'advanced studies'. For this, they have to meet the CS Vice Dean for Graduate Studies in order to decide what courses they should take, and set minimum acceptance grades for these courses.
The Faculty prefers internal students who receive a fellowship and who devote all their time to studies, research, and teaching.

A student who completed his B.Sc. in a recognized institute of higher learning in Israel with Computer Science as his major is not required to take supplementary courses.

Students who graduated from a college will be admitted according to the policy of the School of Graduate Studies, as stated from time to time. Furthermore, a graduate of a college may be admitted as a qualifying student, study 20 credits in this status, and must receive an average of at least 88. The subjects of study will be decided upon in coordination with the CS Vice Dean for Graduate Studies.

Students who have graduated with a B.Sc. in scientific or engineering programs may be admitted. The student should secure a faculty member who will serve as an advisor. It is not obligatory to submit a research proposal upon admission. The study program for each student will be determined in coordination with the advisor and the CS Vice Dean for Graduate Studies, and will be approved by the Admissions Committee.

A student may also be admitted as an external student (that is, without receiving a fellowship). The following three rules apply in this case:

An external student for M.Sc. studies must be present in the Faculty at least two days a week, for at least one year.

The student has an excellent academic record, with a GPA substantially higher than the admission threshold. Such a student will commit to work outside the Faculty for at most three days a week (with the approval of the employer), and to work as a Teaching Assistant in the Faculty (regular load) if required to do so.

In case of a student with an exceptional academic record, the committee may consider admission even if the above conditions are not met.

3.2 Curriculum for the M.Sc. Program

During studies, the student should take a number of courses as described above, and perform research (with thesis or minor thesis) under the supervision of a faculty member. Students with a supplementary program should finish it as well. Course prerequisites are not imposed on graduate students, but students that take a course without its formal prerequisite, must understand that it is their own responsibility to obtain the knowledge necessary for understanding of the course material.

For the supervision of the research, the student should approach a faculty member in his field of interest. In special cases, and in coordination with, and with prior approval of the Graduate Studies Committee, the advisor may be an adjunct teacher or a member of another Faculty in the Technion. External students may neither choose adjuncts nor external faculty as advisors. The research project may be theoretical or involve advanced engineering. In special cases, there is an option of a 'minor thesis', in which case, eight additional credits are required.

Graduates of a B.Sc. degree in a four-year course must complete 40 points of study for the degree, of which 18 are in courses that will be devoted to specialization in the field of research, according to a plan to be determined in coordination with the supervisor, 2 points in the "Extended English" course and 20 credits in conducting a research work (thesis).

Graduates of a B.Sc. degree in electrical engineering and physics at the Faculty of Electrical and Computer Engineering must complete 38 study points for the degree, of which 16 are in courses that will be devoted to specialization in the field of research, according to a program that will be determined in coordination with the supervisor, 2 points in the "Extended English" course and 20 points in conducting research work (thesis).

Students who graduated a three-year program are required to take courses worth 52 credits, of which 20 credits for thesis, 2 credits of “Extended English” course, 30 credits courses of which at least 24 are graduate courses or joint courses for undergraduate and graduate studies. The student must study at least six courses courses of the The Faculty of Computer Science from at least four different groups within the 11 groups of the optional courses (which are neither a project course, nor advanced topics, nor a seminar). Subjects listed in the following groups, with similar professions provided by the Faculty of Electrical Engineering. Listed undergraduate courses may be taken as long as the student does not pass the allowed number of undergraduate credit points. Excellent students can apply for transfer to the Direct Ph.D. Track during their graduate studies.

The remaining courses should be of courses that yield expertise in the proposed research topic, according to a program decided jointly with the student's advisor. The student may take up to three seminars and advanced topics courses before the approval of his research program.
The two following courses are obligatory. Students who did not study the courses:
02370267 Computer architecture
02370343 Theory of computation
in the framework of their B.Sc. studies are required to study them in the framework of the M.Sc. program (the credits will be counted).

At least 6 credits should be taken following the approval of the research proposal. Courses will be approved by the advisor or temporary advisor. It is possible to study up to six credits of undergraduate courses.

The group topics are as follows:

1. Computational Complexity		
02360011	Selected topics in Dynamic Graph Algorithms	3.0
02360306	Random graphs	2.0
02360309	Introduction to coding theory	3.0
02360313	Complexity theory	3.0
02360315	Algebraic methods in computer science	3.0
02360318	Boolean Function Analysis	2.0
02360359	Algorithms 2	3.0
02360374	Probabilistic methods and algorithms	3.0
02360377	Distributed Graph Algorithms	3.0
02360378	Principles of managing uncertain data	2.0
02360508	Cryptography and complexity	2.0
02360518	Communication complexity	2.0
02360521	Approximation algorithms	2.0
02360525	Introduction to network coding, bounds and construction	3.0
02360755	Distributed Algorithms	3.0
02360760	Computational learning theory	2.0

2. Algorithm Theory		
02360011	Selected topics in Dynamic Graph Algorithms	3.0
02360315	Algebraic methods in computer science	3.0
02360357	Distributed algorithms A	3.0
02360359	Algorithms 2	3.0
02360377	Distributed Graph Algorithms	3.0
02360521	Approximation algorithms	2.0
02360715	Methods in analysis of algorithms	3.0
02360719	Computational geometry	3.0
02360755	Distributed algorithms	3.0
02360760	Computational learning theory	2.0
02360779	Foundations of Algorithms for Massive Datasets	2.0
02380739	Discrete algorithmic geometry	2.0

3. Logic and its Applications		
02360025	Automata, logic and games	2.0
02360026	Knowledge and games in distributed systems	2.0
02360304	Logic for computer science 2	3.0
02360342	Introduction to software verification	3.0
02360345	Automatic verification of hardware and software systems	3.0
02360356	Introduction to database theory	3.0
02360378	Principles of managing uncertain data	2.0

4. Cryptology, Coding and Information		
02360309	Introduction to coding theory	3.0
02360350	Network security	3.0
02360379	Coding and algorithms for memories	3.0
02360500	Cryptanalysis	3.0
02360506	Modern cryptology	3.0
02360508	Cryptography and complexity	2.0
02360520	Coding for storage systems	2.0
02360525	Introduction to network coding, bounds and construction	3.0
02360990	Introduction to quantum information processing	3.0

5. Software System Development		
02360268	Constructive computer architecture	3.0
02360271	Android Development	2.0
02360278	Computational accelerators and accelerated systems	3.0
02360319	Programming languages	3.0
02360321	Software engineering methods	3.0
02360332	The internet of things (IoT) – technologies and implementations	2.0
02360342	Introduction to software verification	3.0
02360347	Software synthesis and automated reasoning	3.0
02360351	Distributed Systems	3.0
02360360	Theory of Compilation	3.0
02360363	Databases	3.0
02360369	Programing Web Systems	3.0
02360376	Operating systems engineering	4.0
02360490	Computer Security	3.0
02360491	Secure Programming	3.0
02360496	Reverse Engineering	3.0
02360700	Software design	3.0
02360703	Object-oriented programming	3.0
02360712	Agile software engineering	2.0
02360780	Algorithms for dynamic memory management	2.0

6. Distributed Systems and Communication Networks		
02360026	Knowledge and games in distributed systems	2.0
02360322	Information storage systems	3.0
02360334	Introduction to computer networks	3.0
02360341	Internet networking	3.0
02360350	Network Security	3.0
02360351	Distributed systems	3.0
02360357	Distributed algorithms A	3.0
02360369	Programing Web Systems	3.0
02360370	Concurrent and distributed programming for data processing and machine learning	3.0
02360377	Distributed Graph Algorithms	3.0
02360422	Advanced storage systems and technologies	3.0
02360490	Computer Security	3.0
02360510	Database management systems implementation	3.0
02360668	Advanced topics in blockchain and cryptocurrency protocols	2.0
02360700	Software design	3.0
02360755	Distributed algorithms	3.0

7. Computer Systems		
02360003	Selected topics on data management algorithms for decision making	2.0
02360207	Advanced topics in adversarial attacks on deep learning models and cyber security systems	3.0
02360268	Constructive computer architecture	5.5
02360278	Computational accelerators and accelerated systems	3.0
02360322	Information storage systems	3.0
02360334	Introduction to computer networks	3.0
02360347	Software synthesis and automated reasoning	3.0
02360350	Network security	3.0
02360351	Distributed Systems	3.0
02360360	Theory of Compilation	3.0
02360363	Databases	3.0
02360369	Programing Web Systems	3.0
02360376	Operating systems engineering	4.0

02360379	Coding and algorithms for memories	3.0
02360422	Advanced storage systems and technologies	3.0
02360490	Computer Security	3.0
02360491	Secure Programming	3.0
02360496	Reverse Engineering	3.0
02360510	Database management systems implementation	3.0
02360700	Software design	3.0
02360703	Object-oriented programming	3.0
02360780	Algorithms for dynamic memory management	2.0

8. Computer Vision and Robotics		
02360004	Selected topics in Transformers and attention-based networks	3.0
02360006	Advanced Topics in AI and Robotics	3.0
02360201	Introduction to data processing and representation	3.0
02360330	Introduction to optimization	3.0
02360372	Bayesian networks	3.0
02360759	Diffusion models in deep learning	2.0
02360767	Algorithmic robot motion planning	3.0
02360777	Deep learnig and its applications	3.0
02360781	Deep learning on computation accelerators	3.0
02360860	Digital image processing	3.0
02360861	Geometric computer vision	3.0
02360862	Sparse representations and applications in signal and image processing	2.0
02360873	Computer vision	3.0
02360875	Visual recognition	3.0
02360927	Introduction to robotics	3.0
02380100	Reliability, Equity, and Reproducibility in Modern Machine Learning	2.0
02360790	Multi-grid methods	2.0
02380125	Numerical Algorithms M	3.0

9. Computational Geometry and Computer Graphics		
02360216	Computer graphics 1	3.0
02360324	Computer graphics 2	3.0
02360329	Digital geometry processing	3.0
02360373	Image synthesis	3.0
02360716	Geometric models in CAD systems	3.0
02360719	Computational geometry	3.0
02360759	Diffusion models in deep learning	2.0
02360861	Geometric computer vision	3.0
02380125	Numerical Algorithms M	3.0
02380739	Discrete algorithmic geometry	2.0

10. Machine Learning and Artificial Intelligence		
02360003	Selected topics on data management algorithms for decision making	2.0
02360004	Selected topics in transformers and attention-based networks	3.0
02360006	Advanced Topics in AI and Robotics	3.0
02360018	Selected topics on Sequential Decision Making and Reinforcement Learning	3.0
02360201	Introduction to data processing and representation	3.0
02360203	Advanced Topics in Collaborative Artificial Intelligence	3.0
02360207	Advanced topics in adversarial attacks on deep learning models and cyber security systems	3.0
02360299	Introduction to natural language processing	3.0
02360372	Bayesian networks	3.0
02360501	Introduction to artificial intelligence	3.0
02360667	Advanced Topics in machine learning and human behavior L+T	3.0
02360759	Diffusion models in deep learning	2.0
02360760	Computational learning theory	2.0

02360763	Deep learning and approximation theory	3.0
02360766	Introduction to machine learning	3.5
02360767	Algorithmic robot motion planning	3.0
02360777	Deep learnig and its applications	3.0
02360779	Foundations of Algorithms for Massive Datasets	2.0
02360781	Deep learning on computation accelerators	3.0
02360861	Geometric computer vision	3.0
02380100	Reliability, Equity, and Reproducibility in Modern Machine Learning	2.0
02380125	Numerical Algorithms M	3.0

11. Bioinformatics		
02360522	Algorithms in computational biology	3.0
02360523	Introduction to bioinformatics	2.5

The student must complete 18 credits of graduate courses or joint courses for undergraduate and graduate studies, mostly in Computer Science courses or similar courses in the Faculty of Electrical Engineering courses. The courses will be chosen jointly with the advisor. The student is required to take at least two courses (six credits) after submitting a research proposal.

The two following courses are obligatory. Students who have not studied the courses:
237267 Computer architecture
237343 Theory of computation
in the framework of their B.Sc. studies are required to study them in the framework of the M.Sc. program.

A student pass the supplementary courses at the grade level which will be determined in advance as part of the supplementary program. A student may be exempted from taking a supplementary course if:

1 The student studied a similar, or a more advanced course, in the same field (possibly in another academic institution).
2. The student received an exemption from the teacher of the course .

A complete list of the supplementary courses will be compiled for each student at the time of his acceptance, according to the following list:

Mathematics Courses		
Number	Name	Credits
01040031	Infinitesimal calculus 1M	5.5
01040032	Infinitesimal calculus 2M	5.0
01040166	Algebra AM	5.5
	or	
01040134	Modern algebra H	2.5
00940412	Introduction to probability M	4.0

Computer Science Courses		
Number	Name	Credits
02340123	Operating systems	4.5
02340124	Introduction to systems programming	4.0
02340125	Numerical algorithms	3.0
02340129	Introduction to set theory and automata for CS	3.0
234141	Combinatorics for CS	3.0
234218	Data structures 1	3.0
234247	Algorithms 1	3.0
234292	Logic for CS	3.0

A student has to pass the supplementary courses with an average of 88, and each course with a minimum grade of 80. Students may register to these courses even if they did not take their prerequisites. Upon successful completion of the supplementary

courses, the CS Vice-dean for graduate studies will approve the students transfer to the regular M.Sc. program (either for graduates of three-year or four-year B.Sc.).

4. Ph.d. Studies

4.1 Admission requirements

The prime goal of doctoral studies is the development of an independent research capability culminating in original research work. The student will prepare a detailed scientific thesis based on the research he conducted. The research must be innovative, advance the state of knowledge in the student's chosen research field, and be acceptable for publication in respectable scientific journals in the field.

A candidate who fulfills the formal admission requirements for studying towards a Ph.D. degree as set down by the School of Graduate Studies, or has almost completed his Master's degree and is interested in studying for a Ph.D. degree, shall contact (at any time) the committee for graduate studies in order to enroll.

A candidate may be admitted either as a 'qualifying student' or as a 'regular student'. The former status allows the candidate one semester in which he may fulfill the conditions for admission as a regular student, as explained in Clause 31.02 of the School of Graduate Studies Regulations.

A student must be internal for at least one year during his studies.

4.1.3 Request for Admission

A student applying for admission to doctoral studies will submit at least two letters of recommendation and two standard assessment forms to be provided by the faculty. One of the letters of recommendation should be written by the main supervisor (if there is more than one supervisor), and the other by a faculty member (not necessarily from the Technion), or by a senior researcher familiar with the research work. In order to be accepted for doctoral studies, you must contact a designated supervisor and submit a proposal for a research topic. The Graduate Committee of the Faculty will discuss the application for admission.

4.1.4 Admissions Committee

The admissions committee, composed of members of the Graduate Committee, will discuss the student's application and send the recommendation to the Graduate School.

4.1.5 Conditions of Admission

In order to be admitted as a regular student for a Ph.D. degree, the candidate must fulfill the following conditions:

- Comply with all the formal requirements of the School of Graduate Studies.
- Be admitted by the Graduate Studies Committee, and comply with the requirements of that committee.
- Comply with other requirements (e.g., in case of a change in the field of research) that the Graduate. Studies Committee may decide upon, while discussing the student's request.
- Be approved by the Dean of the School of Graduate Studies.

A candidate who does not comply with the first condition may be accepted as a qualifying student for a period of one semester. During this time he must fulfill all the requirements which will allow a change of status to that of a regular student.

4.1.6 Direct Studies

Outstanding students, studying for a master's degree, can move on to a direct course of study towards a doctorate. If the conditions for such a transfer have been met (according to section 24.07 in the regulations of the School of Graduate Studies), the student will submit an application to the Graduate Studies Committee of the Faculty. The application should include two standard assessment forms to be provided by the faculty and at least two letters of recommendation to be sent directly to the Graduate Studies Coordinator. One of the letters should be written by the supervisor (the principal, if there is more than one supervisor), and the other by a faculty member (not necessarily from the Technion), or another senior researcher familiar with the research paper. If no articles have been accepted yet for publication, an article submitted or prepared for submission is required. In this case, three letters of recommendation are required from experts in the field (of which at least one is independent of the supervisor), relating to the level of the article that has not yet been published and the likelihood of its being accepted for publication.

A CS department **mandatory requirment** is being an **internal student for at least one year** (100% dedication to research, receiving a scholarship, and not working outside the department). This requirment should be fulfilled **after** the transfer to the direct doctoral track.

4.2 Research

4.2.1 General

The prime goal of doctoral studies is the development of an independent research capability culminating in original research work. The student will prepare a detailed scientific thesis based on the research he conducted. The research must be innovative, advance the state of knowledge in the student's chosen research field, and be acceptable for publication in respectable scientific journals in the field.

4.2.2 Advisor and Research Topic

Generally, the candidate must register for doctoral studies after coordinating a supervision with a faculty member and defining a research topic. In exceptional cases, registration will be possible without a supervisor and research topic, and the student will be given an extension of one semester from the beginning of the doctoral studies. An external student is not allowed to choose an adjunct teacher as an advisor.

4.2.3 Candidacy Exam

Towards the end of the first year, the student has to submit a research plan describing his up-to-date achievements and his plans for the continuation of his research. This plan has to be approved by the advisor and the Graduate Studies Committee, and serves as a basis for the candidacy exam.

4.3 Studies

4.3.1 Studies Credits

As of 2025 winter semester, courses requirements for Ph.D. students at the Faculty are:

1. At least 14 credits of graduate computer science courses (or joint courses for undergraduate and graduate studies), of which 2 credits in the required course “Academic Writing for Doctoral Students”.
2. Ph.D. Direct Track students will be required to obtain eight credits in addition to their M.Sc. Studies sum of credits, of which 2 credits in the required course “Academic Writing for Doctoral Students”.

4.3.2 Supplementary Courses

Candidates for a Ph.D., whose previous degrees are not in Computer Science, will be required to take supplementary courses, selected from the obligatory courses in the three-year program for B.Sc.

A candidate may be exempted from the above-mentioned courses if:
- The student has already successfully completed equivalent courses.
- The courses were prerequisites for advanced courses that he has already completed.

The Graduate Studies Committee will determine, on a case-by-case basis, the supplementary courses, as well as the number of graduate credits the student has to complete (4–24). These courses will be selected in coordination with the student's advisor.

5. Faculty research interests



Almagor, Shaull
Senior Lecturer

Formal verification of software and hardware, Model checking, Temporal Logic, Automata, Dynamical systems, Synthesis and Planning.



Amit, Nadav
Senior Lecturer

Operating systems, computer architecture, virtualization, memory management and security.



Attiya, Hagit
Professor

Distributed computation and theoretical computer science; in particular: fault-tolerance; timing-based and asynchronous algorithms.



Bar-Yehuda, Reuven
Professor Emeritus

Combinatorial optimization: graph algorithms; scheduling algorithms, computational geometry.



Baram, Yoram
Professor Emeritus

Statistical learning theory, Pattern recognition; Classification; Regression, Neural networks; Associative memory; Non-linear network dynamics; Virtual reality and feedback control aids for movement disorders.



Barequet, Gill
Professor

Discrete and computational geometry; geometric computing; combinatorics; computer-aided geometric design; computer graphics and visualization.



Belinkov, Yonatan
Senior Lecturer

Natural language processing; machine learning for language understanding and generation; neural network representations; interpretability and robustness of machine learning models.



Ben-Chen, Mirela
Professor

Shape analysis and understanding, 3D geometry processing, deformation and animation, fluid simulation on surfaces, vector field analysis and design, numerical algorithms for geometric data, computer graphics.



Ben-David, Naama
Senior Lecturer

Distributed and concurrent algorithms, both theory and practice, especially performance and correctness in asynchronous fault tolerant environments.



Ben-Eliezer, Omri
Senior Lecturer

Theoretical and algorithmic foundations of big data: sublinear time and streaming algorithms, beyond worst case analysis of algorithms, robustness and privacy, knowledge representation, complex networks.



Biham, Eli
Professor

Cryptology and cryptanalysis; symmetric cryptography, quantum cryptography and quantum computation.



Bronstein, Alexander
Professor

3D acquisition and processing, deformable shape analysis and modelling, computer vision, machine learning, numerical geometry.



Bruckstein, Alfred M.
Professor Emeritus

Image and signal processing, image analysis and synthesis; pattern recognition; applied geometry; robotics, especially ant robotics; estimation theory; neural coding.



Bshouty, Nader H.
Professor

Computational learning theory.



Censor-Hillel, Keren
Professor

Distributed Computing, especially Probabilistic Algorithms and Lower Bounds, and Theory of Computing in General.



Cohen, Reuven
Professor

Architectures and protocols for computer networks: the Internet, wireless networks, cellular networks, broadband access networks, sensor networks, routing protocols, multicast, MAC protocols, and Transport protocols.



El-Yaniv, Ran
Professor

Statistical learning theory, data clustering and compression, applications to information retrieval, web mining, human-computer interaction, biological sequence analysis, texture analysis and synthesis, and music analysis and synthesis; online algorithms: design, theoretical analysis and practical experimentation, computational finance: Portfolio selection algorithms.



Elad, Michael
Professor

Mathematical, algorithmic, and numerical methods in signal and image processing and in deep learning



Elber, Gershon
Professor

Computer aided geometric design; computer graphics.



Etzion, Tuvi
Professor Emeritus

Coding theory; combinatorial algorithms and designs; digital sequences in coding and communication.



Etsion, Yoav
Associate Professor

Computer Architecture, Computer Systems and Parallel Processing, HW/SW
Interoperability, Operating Systems, Parallel Programming Models, High-Performance Computing.



Filmus, Yuval
Associate Professor

Computational complexity, Proof complexity, Analysis of Boolean Functions, Combinatorics.



Fischer, Eldar
Associate Professor

Efficiency of calculations: especially property testing, statistical deductions, and probabilis-tically checkable proofs; combinatorics: especially graph theory, regularity theorems in com-binatorial structures, and applications to algorithms; logic in computer science: logical charac-terization of properties for which there exist efficient algorithms or desirable combina-torial aspects.



Francez, Nissim
Professor Emeritus

Primary: formal semantics of natural language; type-logical grammar; computational linguistics; λ-calculus and proof theory. Secondary: semantics of programming languages; program verification; concurrent and distributed programming; logic programming.



Friedman, Roy
Professor

Distributed systems; group communication; wide-area applications; middleware, CORBA and NET; clustering; distributed multimedia applications; mobile computing.



Geiger, Dan
Professor Emeritus

Probabilistic networks, Bayesian learning, Computational Genetics.



Gil, Joseph
Associate Professor

Software engineering, in particular: aspects related to the object-oriented paradigm, programming languages and parsing.



Grumberg, Orna
Professor Emeritus

Computer-aided verification of software and hardware; model checking; formal verification; temporal logics; modularity; abstraction; distributed model checking, sat-based model checking, games, 3-valued logics.



Heymann, Michael
Professor Emeritus

Specification and Control of Discrete-Event and Hybrid Systems; Systems and Control Theory; Robotics; Optimization Theory.



Ishai, Yuval
Professor

Cryptography, Complexity theory.



Itai, Alon
Professor Emeritus

Deterministic and Randomized Data Structures and Algorithms, Algorithms for secondary storage, Corpora Based Natural Language Processing, Computational Learning Theory, Distributed Computing.



Itzhaky, Shachar
Senior Lecturer

Software synthesis; High-level and automated programming; Functional programming languages; Formal proof assistants.



Kaminski, Michael
Professor Emeritus



Katz, Shmuel
Professor Emeritus

Program verification; formal specification methods; aspect-oriented software development; distributed systems; programming methodology; temporal logic; partial orders; programming languages; software engineering.



Keren, Sarah
Senior Lecturer

Multi-agent AI, multi-robot systems, automated design of AI systems, sequential decision making under uncertainty, reinforcement learning and automated planning.



Kimelfeld Benny
Professor

Database systems and theory, information extraction, information retrieval, data mining, probabilistic and inconsistent databases.



Kimmel, Ron
Professor

Image processing, computer vision, medical image analysis, computer graphics, differential geometry, scientific computing, machine learning.



Kohavi, Zvi
Professor Emeritus

Failure-Tolerant design, testing and fault diagnosis of digital systems; Switching and finite-automata theory; Reliability.



Kushilevitz, Eyal
Professor

Cryptography; Machine learning; computational complexity and commu-nication complexity; randomized distributed protocols. Image processing and computer vision, especially the statistical analysis of visual tasks.



Lindenbaum, Michael
Professor Emeritus

Image processing and Computer Vision, especially the statistical analysis of visual tasks.



Litany, Or
Senior Lecturer

Computer vision: 3D scene understanding (detection, segmentation), neural fields (nerf, sdf), reconstruction and generative models (surface reconstruction, scene completion); data-driven simulation. AI/ML: Data efficient learning (self/semi-supervised, learning with noisy labels) , symmetric architectures (rotation/permutation equivariance)



Litman, Ami
Associate Professor (Ret.)

Interconnection networks; parallel computation on fixed connection networks; systolic systems; layout of networks; digital systems, VLSI.



Makowsky, Johann
Professor Emeritus

Logic and complexity; complexity over the reals; algebraic combinatorics.



Markovitch, Shaul
Professor

Artificial Intelligence, Machine Learning, Natural Language Semantics, Feature Generation, Speedup Learning, Anytime Learning, Active Learning, Selective Learning, Information retrieval, Multi-agent Systems, Adversary search, Opponent Modeling, Search, Resource-bounded reasoning, Anytime Learning, Cost-sensitive Learning.



Mendelson, Avi
Visiting Professor

Computer Architecture - heterogeneous systems, system-on-a-chip, power management, fault-tolerance, GPGPU; Operating Systems - for system-on-chip and hetero-geneous systems; Real-Time systems - WCET for single processor and multi-processors, operating system, mix-criticality power management for RT systems.



Mor, Tal
Professor

Theoretical quantum information processing (computing, cryptography, information, commu-nication); implementation (hardware) of quantum information processing; modern cryptology.



Moran, Shlomo
Professor Emeritus

Algorithmic aspects of bioinformatics (with emphasis on phylogenetics); combinatorics and graph theory.



Naor, Seffi (Joseph)
Professor

Theory of algorithms and applications; Randomness and computation; approximation and on-line algorithms; combinatorial optimization; randomized algorithms; communication networks; parallel computation.



Paz, Azaria
Professor Emeritus

Theory of automata, deterministic and probabilistic; Theory of algorithms and integer algorithms; Theory of Bayes networks and Theory of Graphoids



Peleg, Hila
Senior Lecturer

Interaction models for program synthesis, software developer workflows, programming languages, software engineering, human-computer interaction.



Petrank, Erez
Professor

Concurrent Algorithms: theory and practice; Memory Management (in particular for modern arallel architectures); Operating Systems, Programming Languages.



Pinter, Ron
Emeritus Professor

Bioinformatics; High performance computing; Programming languages; Compiler technology; Automated design of integrated circuits; Information organization and retrieval; Data integration; Algorithmic number theory.



Raz, Danny
Professor

Theory and applications of management related problems in IP networks; active networks, network location problems, theory of network management, QoS routing, wireless networks, and other optimization problems.



Rivlin, Ehud
Professor

Robot vision; robot navigation; motion planing; visual servoing; active vision; object recognition; artificial intelligence; image understanding, image processing; image databases.



Romano, Yaniv
Senior Lecturer

Data science and machine learning; reproducibility, reliability, and fairness in modern machine learning; data-driven inference; deep neural representations; computational imaging.



Rosenfeld, Nir
Senior Lecturer

Behavioral machine learning; Learning with humans in the loop; Machine learning for decision support;

Learning with the presence of human actors; Social and behavioral modeling; Societal implications of using predictive methodologies.



Roth, Ronny
Professor

Error-correcting codes; coding for magnetic and optical recording; application of coding theory to complexity; information theory; digital communication.



Rothblum, Ron
Associate Professor

Cryptography and Computational Complexity.



Rottenstreich, Ori
Associate Professor

Blockchain, Computer Networks, Algorithms..



Salzman, Oren
Senior Lecturer

Robotics, Algorithmic motion planning, Foundations of robotic planning, Computational challenges in robotics.



Schwartz, Roy
Associate Professor

Design and analysis of algorithms, combinatorial optimization, approximation algorithms, the geometry of metric spaces and its applications, submodular optimization, and randomized algorithms.



Schuster, Assaf
Professor

Parallel and distributed computing; peer-to-pear computing large scale data mining; scalable model checking; high-performance computer architecture; shared memory consistency models; java memory model; fault tolerance; distribute shared memory; non-stop systems.



Shachnai, Hadas
Professor

Design and analysis of algorithms for combinatorial optimization problems, in particular, algorithms for packing, scheduling and resource allocation problems arising in Information and Communication serCS Vices; parameterized algorithms and their usage in approximation; randomized algorithms; parallel computation.



Shlomi, Tomer
Professor

Bioinformatics/Systems-Biology; biological-network analysis: constraint-based modeling of metabolic networks; protein-interaction network analysis.



Shmueli, Oded
Professor Emeritus

Database systems: theoretical aspects of query processing in relational databases, xml databases and logic based databases (datalog); system issues: physical storage, concurrency control, recovery, replication and distribution; querying the WWW; electronic commerce; automated negotiation.



Sidi, Avram
Professor Emeritus

Theory and application of scalar and vector extrapolation methods; numerical integration; numerical linear algebra; numerical solution of integral equations; padé and other related rational approximations.



Tsafrir, Dan
Associate Professor

Operating systems, parallel systems, security, performance evaluation.



Ungarish, Marius
Professor Emeritus

Simulations of rotating fluids (incompressible, compressible, two-phase, liquid metals); two-phase flows; gravity currents; computational fluid dynamics, implementation of parallel computers, numerical methods.



Vizel Yakir
Senior Lecturer

Formal verification of hardware and software systems; Model Checking; SAT/SMT solving; Abstraction techniques; Security Verification; Hardware-Software Co-Verification; Machine learning for verification.



Wajc, David
Senior Lecturer

Algorithms, especially for massive evolving data, including online, dynamic and streaming algorithms.



Yaakobi, Eitan
Professor

Information and coding theory with applications to non-volatile memories, associative memories, data storage and retrieval, and voting theory.



Yadgar, Gala
Senior Lecturer

Operating systems, file systems, storage systems and deCS Vices, large scale data centers, cache management and content distribution, codes for storage systems.



Yahav, Eran
Professor

Program analysis, abstract interpretation, program verification, program synthesis, concurrent and distributed systems, programming languages, and software engineering.



Yakhini, Zohar
Associate Visiting Professor

Computational biology and bioinformatics.



Youngmann, Brit
Senior Lecturer

Database systems, data management, data mining, data discovery and integration, causal inference, and responsible data management.



Yavneh, Irad
Professor

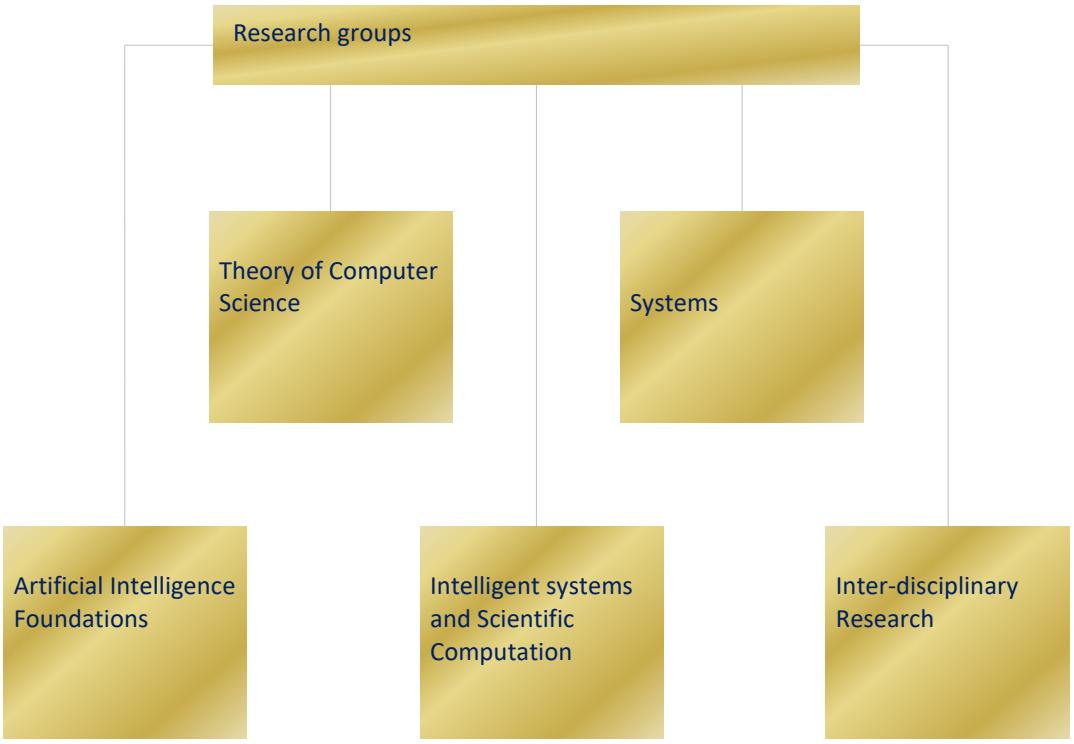
Multigrid computational methods; scientific computing; computational physics; geophysical fluid dynamics; image processing and analysis; numerical analysis.



Zaks, Shmuel
Professor Emeritus

Theory of distributed computing; atm and optical networks; combinatorial and graph algorithms; combinatorics and graph theory; discrete mathematics.

6. Research Groups structure



Theory of Computer Science

Automata and Formal Languages:
N. Francez
O. Grumberg
M. Kaminski
B. Kimelfeld
A. Paz

Coding:
E. Yaakobi
T. Etzion
R. Roth
G. Yadgar

Complexity:
R. Bar-Yehuda
N. Bshouty
Y. Filmus
E. Fischer
Y. Ishai
M. Kaminski
E. Kushilevitz

Computationl Geometry:
R. Bar-Yehuda
G. Barequet

Cryptology:
E. Biham
Y. Ishai
E. Kushilevitz

Database Theory Algorithms:
B. Kimelfeld
O. Shmueli

Distributed Computing:
H. Attiya
N. Ben-David
K. Censor-Hillel
R. Friedman
E. Petrank
A. Schuster
S. Zaks

Human-Computer Interaction:
H. Peleg

Logic and Semantics:
N. Francez
O. Grumberg
M. Kaminski
S. Katz
B. Kimelfeld
J. Makowsky
E. Yahav
Y. Vizel

Theory of Algorithms:
R. Bar-Yehuda
G. Barequet
N. Ben-David
K. Censor-Hillel
E. Fischer
A. Itai
S. Moran
J. Naor

Systems

Databases and Data Mining:
N. Ben-David
J. Gil
B. Kimelfeld
A. Schuster
O. Shmueli
B. Youngmann

Distributed & Parallel Systems:
N. Amit
H. Attiya
Y. Etsion
R. Friedman
E. Petrank
A. Schuster
D. Tsafrir
G. Yadgar

Hardware & Computer Architecture:
N. Amit
Y. Etsion
Z. Kohavi
A. Litman
A. Mendelson
T. Mor
Y.Vizel

Networks, Communication & Systems:
R. Cohen
A. Litman
D. Raz
R. Roth
O. Rottenstreich

Operating Systems & Virtualization
N. Amit
Y. Etsion
A. Mendelson
A. Schuster
D. Tsafrir
G. Yadgar

Programming Languages:
J. Gil
S. Itzhaky
H. Peleg
E. Petrank
D. Tasfrir
E. Yahav

Software & Hardware Verification:
O. Grumberg
M. Heymann
S. Katz
Y.Vizel
E. Yahav

Software Engineering:
J. Gil
R. Friedman
S. Itzhaky
E. Kantorowitz
S. Katz
H. Peleg

Storage:
Y. Kanza
E. Petrank
A. Schuster
D. Tsafrir
E. Yaakobi
E. Yahav
G. Yadgar

System Security:
N. Amit
E. Biham
D. Tsafrir
E. Yahav

Artificial Intelligence Foundations

Machine Learning:
Y. Baram
Y. Belinkov
A. Bronstein
N. Bshouty
A. Itai
R. El- Yaniv
M. Elad
D. Geiger
R. Kimmel
O. Litany
S. Markovitch
K. Radinsky
Y. Romano

Neural Networks & Deep Learning:
Y. Belinkov
R. El- Yaniv
M. Elad

Y. Baram
A. Bronstein
O. Litany
A. Mendelson
R. Kimmel

Logical and Probabilistic Reasoning:
D. Geiger

M. Kaminski
S. Keren

Intelligent systems and Scientific Computation

Geometric Modeling:
A. Bronstein
A. Bruckstein
G. Barequet
M. Ben-Chen
G. Elber

Robotics & Complex Systems:
A. Bruckstein
M. Heymann
S. Keren
E. Rivlin

Graphics:
A. Bronstein
M. Ben-Chen
G. Elber
R. Kimmel

Scientific Computation & Numerical Algorithms:
A. Bronstein
M. Elad
R. Kimmel
Y. Romano

A. Sidi

Image Processing & Computer Vision:
A. Bronstein
A. Bruckstein
M. Elad
R. Kimmel
M. Lindenbaum
O. Litany
Y. Romano
E. Rivlin

Biological Computation:
Y. Baram

Interdisciplinary Research

Bioinformatics:
D. Geiger
S. Moran
R. Pinter
T. Shlomi
Z. Yakhini

Computational Linguistics & Natural Language Processing:
Y. Belinkov
N. Francez
A. Itai
B. Kimelfeld

Quantum Information Processing:
Y. Baram
E. Biham
T. Mor

WWW, Game Theory, Electronic Commerce, Crypto Currency, Compu-tational Finance
R. El-Yaniv
S. Markovitch
J. Naor
K. Radinsky