

Sergiu IVANOV — CV

Maître de conférences — Associate Professor

IBISC Laboratory / Department of Computer Science, [Université d'Évry Paris-Saclay](#)

IBGBI, 23 boulevard de France, 91034 Évry-Courcouronnes, France

sergiu.ivanov@universite-paris-saclay.fr

<https://www.ibisc.univ-evry.fr/~sivanov/>

1 Career overview

- 2017– **Maître de conférences — Associate Professor** (tenured)
50% research, 50% teaching
IBISC Laboratory — Department of Computer Science
Université d'Évry Paris-Saclay
- 2016–2017 **Post-doctoral researcher**
Biomechanical modelling of blood platelet cytoskeleton during platelet activation
Supervisor: Nicolas GLADE
[TIMC Laboratory CNRS UMR 5525, Université Grenoble-Alpes](#)
- 2015–2016 **Attaché Temporaire d'Enseignement et de Recherche —**
Temporary Teaching Assistant
[LACL Laboratory, Université Paris-Est Créteil](#)
- 2012–2015 **PhD student**
On the Power and Universality of Biologically-inspired Models of Computation
Directed by Sergey VERLAN, defense on 2015-06-23
192h = 3 × 64h of teaching at the Departement of Computer Science
[LACL Laboratory, Université Paris-Est Créteil](#)
- 2011–2012 **M1 student**
MSc programme *Mathematics and Computer Science*
Google Summer of Code 2012 participant
University of the Academy of Sciences of Moldova
- 2009–2012 **Research engineer** (part time)
Supervisor: Yurii ROGOZHIN
[Institute of Mathematics and Computer Science of Moldova](#)
- 2007–2011 **Bachelor in Computer Engineering**
Average grade over the 4 years: 10 out of 10
Google Summer of Code 2008 participant
[Technical University of Moldova](#)

2 PhD thesis

Title: *On the Power and Universality of Biologically-inspired Models of Computation*
Director: **Sergey VERLAN**
Defense: June 23, 2015 (2015-06-23)
Institution: LACL Laboratory, Université Paris-Est Créteil
 doctoral contract attached to Université Paris-Est

PhD thesis jury

Jean-Louis GIAVITTO CNRS Senior scientist (DR CNRS) at IRCAM	President
Jérôme DURAND-LOSE Full Professor at Université d'Orléans	Reviewer
Gheorghe PĂUN Titular member of the Romanian Academy	Reviewer
Philippe SCHNOEBELEN CNRS Senior scientist (DR CNRS) at LSV lab (now LMF)	Reviewer
Enrico FORMENTI Full Professor at Université Côte d'Azur	Examiner
Elisabeth PELZ Full Professor at Université Paris-Est Créteil	Examiner

3 Teaching

My teaching spans most university years, starting from L1 (freshman year) through to M2 (second year of the Master's program). I mostly teach computer science and engineering at the *licence* level (approximately, bachelor), and mostly theoretical biology, network biology, and bioinformatics at the Master's level. I have a CRCT (approximately, sabbatical) for the school year 2023–2024.

The following tables briefly list the courses I teach, am in charge of (marked with the sign †), or share the responsibility of (marked with the sign *), together with the typical teaching hours. I only describe the time period after I obtained the current tenured Maître de conférences position.

3.1 Master's level courses

2022–2023	M2 GENIOMHE	Computational DNA nanotechnology* SI: ¹ 7.5h CM+TD, Damien REGNAULT: 7.5h CM+TD
2017–2023	M2 GENIOMHE	Computational Systems Biology & Network Medicine* SI: 12h CM+TD, Franck DELAPLACE: 12CM+TD
2017–2023	M2 SSB	Network Systems: Modelling and Analysis* SI: 12h CM+TD, Franck DELAPLACE: 9CM+TD
2017–2023	M2 CNS	Systèmes multi-agents* SI: 9h CM+TD, Guillaume HUTZLER: 9h CM+TD

3.2 Bachelor level courses

2017–2023	L3 informatique	Projet Professionnel d'Études et d'Insertion† SI: 9h TD
2017–2023	L3 informatique	Systèmes d'exploitation† SI: 18h CM + 18h TD
2020–2023	L2 informatique	Programmation système SI: 18h TD

¹SI = hours taught by Sergiu IVANOV.

2017–2023	L1 informatique	Algorithmique et programmation SI: 36h TD
2017–2023	L1 informatique	Programmation impérative SI: 36h TD
2020–2023	L1 informatique	Méthodologie SI: 12h TD
2019–2021	L1 informatique	Architecture SI: 18h TD
2018–2021	L1 informatique	Émulateur pédagogique Supplementary course for Parcoursup OUI-SI candidates. SI: 10h TD

3.3 Other courses

2020	Open online class	Introduction to Membrane Computing* SI: 4h CM online + 4h TD online, David ORELLANA-MARTÍN: 6h CM online + 4h TD online
2017–2024	Popular science	Fête de la Science – Science Days* SI: 2 full days on the stand + organization

3.4 Teaching and research

All Master’s level courses I teach link directly to my research. In the course **Computational DNA nanotechnology**, we introduce the students to DNA self-assembly and its potential applications, including applications in biology and medicine. We typically overview the state of the project I share with Damien REGNAULT to build a functioning pipeline for self-assembly of DNA nanostructures, spanning the entire spectrum from theoretical design to actual wet-lab production.

Both the courses **Computational Systems Biology & Network Medicine** and **Network Systems: Modelling and Analysis** focus on another major pillar of my research: approaching the complexity of biological systems using the tools of network science and discrete dynamical systems. More concretely, in these classes we introduce the students to the basics of graph theory, and then extensively discuss two formal models of discrete dynamical networks—Boolean networks and Petri nets—as well as show concrete applications for therapy inference or setting up formal frameworks for thinking about the origins of Life.

Finally, I use the course **Systèmes multi-agents** (*Multi-agent systems*) as an opportunity to introduce the students to emergent complexity of the living systems, made up of simple entities interacting in complex ways. In this course, we discuss different tools which can formalize multi-agent systems—in particular membrane (P) systems—and propose several practical assignments to help the students better understand the connection between abstract objects and concrete systems.

Outside my normal teaching activity, I particularly appreciate **Science Days** (*Fêtes de la Science*), which are always an excellent opportunity to illustrate the hallmarks of my research to school students and the general public. I have taken part in Science Days every year, including during the pandemic when we held online stands, and I have consistently invested a considerable effort in organizing the stands.

Finally, even though my bachelor level courses are not in direct connection to my research, I always bring in discussions of complexity and even theoretical biology, to illustrate some abstract concepts on the one hand, and to challenge the students and push them out of their comfort zone on the other hand.

4 Organization of scientific events

2022	IBISC Laboratory Day coorganization with Guillaume POSTIC
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- 2022 Seminar **Workshop on the Atavistic Theory of Cancer – ATAC2022**
coorganization with Nicolas GLADE and Angélique STÉPHANOU
- 2020 Online **Conference on Membrane Computing – CMC 2020**
coorganization with Rudolf FREUND
- 2018 Seminar of the **French-speaking Society for Theoretical Biology (SFBT)**
coorganization with Nicolas GLADE and Angélique STÉPHANOU
- 2018 Joint conferences **Unconventional Computation, Natural Computation – UCNC2018** and **Machines, Computations, and Universality – MCU 2018**
main organizer: Sergey VERLAN
- 2018 **Workshop on Membrane Computing**
conference *Unconventional Computation, Natural Computation – UCNC 2018*
coorganization with Rudolf FREUND
- 2017 **IBISC Laboratory Day**
coorganization with Najett NEJI

5 Scientific roles

- 2022–2026 Elected member of the **Research Commission** of Université d'Évry Paris-Saclay
- 2021–2023 Elected member of the **IBISC Laboratory Council**
- 2019–2021 Appointed member of the **IBISC Laboratory Council**
- 2020– Manager of the **work group on personalized medicine** of IBISC
coorganization with Farida ZEHRAOUI
- 2017– IBISC representative to the group **Méthodes Formelles pour les Systèmes Logiciels et Matériels – MeFoSyLoMa** (*Formal Methods for Software and Hardware systems*)

6 Projects and grants

- 2022 FRR² *Setting up experimental projects in DNA self-assembly*
3 k€ Role: **Principal Investigator**
Other Principal investigator: Damien REGNAULT
- 2021 IXXI³ *Exploration of evolutivity and robustness of biological networks – Characterisation of structural and dynamic connected components of sign Boolean networks, as well as of viability constraints*
4 k€ Role: **Investigator**
Principal investigator: Nicolas GLADE
- 2018–2019 DIM RFSI *Computer Science Models for Cellular Reprogramming*
11 k€ Role: **Principal investigator**
Other investigators: Franck DELAPLACE, Loïc PAULEVÉ

7 Distinctions

- 2023–2025 **RIPEC C3 for scientific activity**
3-year monthly ministerial premium for outstanding research work
- 2023–2024 **Congé de Recherche ou de Conversion Thématique – CRCT**
Leave for research or thematic conversion

²FRR = project-based competitive local funding of Université d'Évry Paris-Saclay.

³IXXI = Institute of Complex Systems of the Auvergne-Rhône-Alpes region.

8 Reviews and editorial activity

8.1 Program and scientific committees

2023	Non-Classical Models of Automata and Applications (NCMA) Member of the Program Committee
2022–2023	Conference on Membrane Computing (CMC) Member of the Program Committee
2022–	Computer Science Journal of Moldova Member of the Editorial Board
2020	International Conference on Membrane Computing (ICMC) Co-chair of the Program Committee
2018	Unconventional Computation and Natural Computation (UCNC) Member of the Program Committee
2018–2019	Acta Biotheoretica Guest editor after the seminar of the <i>Société Francophone de la Biologie Théorique</i>

8.2 Journal reviews

I have reviewed and regularly review papers for the following journals.

Theoretical Computer Science	Fundamenta Informaticae
Lecture Notes for Computer Science	Journal of Cellular Automata
Swarm and Evolutionary Computation	Socio-Ecological Practice Research
Journal of Symbolic Computation	Journal of Membrane Computing
International Journal of Foundations of Computer Science	Indian Journal of Pure and Applied Mathe- matics
Concurrency and Computation: Practice and Experience	Journal of Automata, Languages, and Com- binatorics
Computer Science Journal of Moldova	Natural Computing

I am a recommender for Peer Community In Mathematical and Computational Biology.

8.3 Conference reviews

I reviewed papers for the following conferences multiple times, without being on the Program Committee: Conference on Membrane Computing (CMC), Machines, Computations, and Universality (MCU), Developments in Language Theory (DLT), Unconventional Computation and Natural Computation (UCNC).

9 Jurys

9.1 PhD defences

Sara RIVA

Title:	Factorization of Discrete Dynamic Systems
Director:	Enrico FORMENTI, Université Côte d'Azur
Co-director:	Alberto DENNUNZIO, Università degli Studi di Milano-Bicocca
Duration:	2019–2022
Defense:	November 22, 2022 (2022-11-22)
Institution:	Université Côte d'Azur
SI's role:	Examiner

9.2 Individual PhD monitoring committees (CSI)

Hala DJEGHIM

Title: **In-details scene understanding for realistic data generation**
 Directors: Dro Désiré SIDIBÉ, Université Évry Paris-Saclay
 Nathan PIASCO, Huawei
 Durée: 2023–
 Institution: Université Paris-Saclay
 SI's role: **President**

Sofía VARGAS IBARRA

Title: **Thrombus imaging with AI for patients stratification**
 Directors: Vincent VIGNERON, Université Évry Paris-Saclay
 Sonia GARCIA-SALICETTI, Télécom SudParis
 Durée: 2022–
 Institution: Université Paris-Saclay
 SI's role: **President**

Rémi SEGRETAIN

Title: **Complexity and evolution: a study of sign Boolean networks**
 Director: Nicolas GLADE, Université Grenoble-Alpes
 Duration: 2019–
 Institution: Université Grenoble-Alpes
 SI's role: **Member**

9.3 Committees for *Maitre de conférences* positions (CoS)

2022, 2024 MCF CNU 27 at Université d'Évry Paris-Saclay (IBISC)
 2022 MCF CNU 27 at Université Paris-Est Créteil (EPISEN / LACL)

10 Doctoral students

Jérémie PARDO

Title: **Computational methods for the inference of therapeutic targets and sequences of treatment**
 Director: Franck DELAPLACE 50%, Université Paris-Saclay
 Co-supervisor: **Sergiu IVANOV 50%**
 Duration: 2019–2022
 Defense: February 3, 2022 (2022-02-03)
 Institution: Université Paris-Saclay

Dr. Jérémie PARDO is currently working as a contractor for the digital services of Thales Group.

Publications

- [1] Jérémie Pardo, Sergiu Ivanov, and Franck Delaplace. “Sequential reprogramming of biological network fate.” In: *Theor. Comput. Sci.* 872 (2021), pp. 97–116.
- [2] Jérémie Pardo, Sergiu Ivanov, and Franck Delaplace. “Sequential Reprogramming of Biological Network Fate.” In: *Computational Methods in Systems Biology - 17th International Conference, CMSB 2019, Trieste, Italy, September 18-20, 2019, Proceedings*. Ed. by Luca Bortolussi and Guido Sanguinetti. Vol. 11773. Lecture Notes in Computer Science. Springer, 2019, pp. 20–41.

Louison CRÉPIN

Title: **Modelling Mechanisms of Secondary Resistance**
 Director: Franck DELAPLACE 50%, Université Paris-Saclay
 Co-supervisor: **Sergiu IVANOV 50%**
 Duration: 2023–
 Institution: Université Paris-Saclay

11 Research internships

- May–Jun 2023 **Noémie HARMAND** – *Self-assembly of 3-dimensional shapes by DNA origami*
 UEVE⁴ 3rd year intern (L3)
 Sergiu IVANOV 75%, Damien REGNAULT 25%
- Sep 2022 – Jan 2023 **Ai-Ling NGUYEN BONNET** – *Efficient exploration strategies in the evolutionary mille-feuille*, CentraleSupélec 4th year intern
 Sergiu IVANOV 50%, Nicolas GLADE 50%
- Jun–Jul 2022 **Vincent FERRARI-DOMINGUEZ** – *Controllability of complex systems*
 ENS Paris 3rd year intern
 Sergiu IVANOV 50%, Nicolas GLADE 50%
Publications: [1] and another draft in progress
- Apr–Jun 2022 **Saïd IDER** – *Phase transitions in complex systems*
 UEVE 3rd year intern (L3)
 Sergiu IVANOV 100%
- Apr–Jun 2022 **Idriss BEN SAÏD** – *Software simulation of DNA self-assembly models*
 UEVE 3rd year intern (L3)
 Sergiu IVANOV 100%
- Apr–Jun 2022 **Mustapha SI KADDOUR** – *DNA self-assembly and array grammars*
 UEVE 3rd year intern (L3)
 Sergiu IVANOV 100%
- Jun–Aug 2021 **Rémy DÉFOSSÉZ** – *Evolutionary mille-feuille: a new formalization of evolution*
 ENS Paris 3rd year intern
 Sergiu IVANOV 50%, Nicolas GLADE 50%
- Feb–Apr 2021 **Aurélien LARCHÈRES, Maxime WANG** – *Artificial evolution of sign Boolean networks*, UEVE 4th year research project (M1 TER)
 Sergiu IVANOV 75%, Nicolas GLADE 25%
- Feb–Apr 2020 **Yacine HADJAR, Imad BOUZGOU** – *Multi-agent modelling of rheumatoid arthritis*
 UEVE 4th year research project (M1 TER)
 Sergiu IVANOV 75%, Anna NIARAKIS 25%
- Apr–Jun 2017 **Clément HEGE** – *Numerical experimental study of the diversity and survival of artificial life forms in an environment stratified under the influence of differential sedimentation*, ENSIMAG 4th year research project (M1)
 Sergiu IVANOV 25%, Nicolas GLADE 75%

Internship publications

- [1] Artiom Alhazov, Vincent Ferrari-Dominguez, Rudolf Freund, Nicolas Glade, and **Sergiu Ivanov**. “A P systems variant for reasoning about sequential controllability of Boolean networks.” In: *Theor. Comput. Sci.* 970 (2023), p. 114056.

⁴UEVE = Université d’Évry Paris-Saclay.

12 Research overview

The structuring objective of my research is *striking a Deal with Life*: establishing a theoretical framework and sketching out practical approaches for *mutually beneficial interactions* with living systems. My work falls into the following 2 broad categories:

1. deepening the knowledge about complex biological systems and suggesting improvements for health-related applications,
2. setting up formal frameworks for better conceiving of the grand processes of Life.

The following sections provide the keywords situating the domains and approaches I apply in my work, together with the corresponding works and publications.

12.1 Bioinformatics

- network controllability, theoretical cell fate reprogramming, therapy inference [ch1, j1, c1, j11, c6]: Jérémie PARDO and Louison CRÉPIN's PhD theses, Vincent FERRARI-DOMINGUEZ's internship
- biological modelling [j26, j29, j16, j21]
- a promising collaboration on multi-agent modelling of rheumatoid arthritis with Anna NIARAKIS which fell victim to the Covid19 pandemic (Yacine HADJAR and Imad BOUZGOU's internship in 2020)

12.2 Theoretical biology

- complexity increase during evolution [j14, c4, c12]
- robustness, evolvability, and viability [c3]: Rémy DÉFOSSEZ and Ai-Ling NGUYEN-BONNET's internships
- origins of life: Aurélien LARCHÈRES, Maxime WANG, Saïd IDER, and Clément HEGE's internships, ongoing collaboration with Nicolas GLADE
- atavistic theory of cancer: Workshop on the Atavistic Theory of Cancer ATAC2022, ongoing collaboration with Nicolas GLADE and Angélique STÉPHANOU

12.3 Natural computing

- membrane (P) systems, multiset rewriting, register machines [j2, j3, j5, j6, j7, j9, j12, j13, j17, j18, j20, j28, j33, j35, j36, j37, j39, c5, c7, j19, c9, c10, c11, c13, c14, c15, c16, c18, c23, c24, c25]
- string rewriting, regulated string rewriting [j4, j8, j10, j23, j27, j31, j32, c2, c8, c17, c22]
- discrete dynamical networks [j15, j25, j34, c19]
- array grammars [j22, c20, c21]

12.4 DNA computing

- DNA origami: ongoing collaboration across 3 other laboratories in Évry: Marco Antonio MENDOZA PARRA (SysFate, ISSB), Loïc HAMON (SABNP), and Guillaume LAMOUR (LAMBE)
- new Master's level course *Computational DNA nanotechnology*
- theory of tile-based self-assembly: Noémie HARMAND, Idriss BEN SAÏD, and Mustapha SI KADDOUR's internships

I carry out this work in collaboration with Damien REGNAULT.

13 Publications

I co-authored 1 book chapter, 39 journal papers, and 25 peer-reviewed conference papers. This list omits 3 technical reports and 8 preprints. The paper [c3] received the Best Student Paper award at the 21st IEEE International Conference on Bioinformatics and BioEngineering. The paper [j6] received the Best Paper award at the International Conference on Membrane Computing (ICMC) in 2020. The paper [j13] received the Best Paper award at the Asian Conference on Membrane Computing (ACMC) in 2017.

The order of the authors depends on the domain. Generally, papers in theoretical computer science feature alphabetical order (e.g., [j1, j2, j3, j4, j5]), while in papers in theoretical biology (e.g., [j14, c3, c4]) and bioinformatics (e.g., [ch1, j11, c6]) the order of the authors reflects the type of contribution.

Book chapters

- [ch1] Elio Nushi, Victor-Bogdan Popescu, Jose-Angel Sanchez Martin, **Sergiu Ivanov**, Eugen Czeizler, and Ion Petre. “Network Modelling Methods for Precision Medicine.” In: *Systems Biology Modelling and Analysis*. John Wiley & Sons, Ltd, 2022. Chap. 10, pp. 363–423. ISBN: 9781119716600.

Peer-reviewed journals

- [j1] Artiom Alhazov, Vincent Ferrari-Dominguez, Rudolf Freund, Nicolas Glade, and **Sergiu Ivanov**. “A P systems variant for reasoning about sequential controllability of Boolean networks.” In: *Theor. Comput. Sci.* 970 (2023), p. 114056.
- [j2] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Numerical networks of cells.” In: *Theor. Comput. Sci.* 958 (2023), p. 113873.
- [j3] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Marion Oswald. “Variants of derivation modes for which purely catalytic P systems are computationally complete.” In: *Theor. Comput. Sci.* 920 (2022), pp. 95–112.
- [j4] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Regulated Insertion-Deletion Systems.” In: *J. Autom. Lang. Comb.* 27.1-3 (2022), pp. 15–45.
- [j5] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Tissue P Systems with Vesicles of Multisets.” In: *Int. J. Found. Comput. Sci.* 33.3&4 (2022), pp. 179–202.
- [j6] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “P systems with limited number of objects.” In: *J. Membr. Comput.* 3.1 (2021), pp. 1–9.
- [j7] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “When catalytic P systems with one catalyst can be computationally complete.” In: *J. Membr. Comput.* 3.3 (2021), pp. 170–181.
- [j8] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Marion Oswald. “Relations between Control Mechanisms for Sequential Grammars.” In: *Fundam. Informaticae* 181.2-3 (2021), pp. 239–271.
- [j9] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Variants of derivation modes for which catalytic P systems with one catalyst are computationally complete.” In: *J. Membr. Comput.* 3.4 (2021), pp. 233–245.
- [j10] **Sergiu Ivanov** and Sergey Verlan. “Single semi-contextual insertion-deletion systems.” In: *Nat. Comput.* 20.4 (2021), pp. 703–712.

- [j11] Jérémie Pardo, **Sergiu Ivanov**, and Franck Delaplace. “Sequential reprogramming of biological network fate.” In: *Theor. Comput. Sci.* 872 (2021), pp. 97–116.
- [j12] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “P systems with randomized right-hand sides of rules.” In: *Theor. Comput. Sci.* 805 (2020), pp. 144–160.
- [j13] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, Linqiang Pan, and Bosheng Song. “Time-freeness and clock-freeness and related concepts in P systems.” In: *Theor. Comput. Sci.* 805 (2020), pp. 127–143.
- [j14] Urvan Christen, **Sergiu Ivanov**, Rémi Segretain, Laurent Trilling, and Nicolas Glade. “On Computing Structural and Behavioral Complexities of Threshold Boolean Networks.” In: *Acta Biotheoretica* 68 (2020), pp. 119–138.
- [j15] Franck Delaplace and **Sergiu Ivanov**. “Bisimilar Booleanization of multivalued networks.” In: *Biosyst.* 197 (2020), p. 104205.
- [j16] **Sergiu Ivanov** and Ion Petre. “Controllability of reaction systems.” In: *J. Membr. Comput.* 2.4 (2020), pp. 290–302.
- [j17] Sergey Verlan, Rudolf Freund, Artiom Alhazov, **Sergiu Ivanov**, and Linqiang Pan. “A formal framework for spiking neural P systems.” In: *J. Membr. Comput.* 2.4 (2020), pp. 355–368.
- [j18] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “Variants of P systems with activation and blocking of rules.” In: *Nat. Comput.* 18.3 (2019), pp. 593–608.
- [j19] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, Marion Oswald, and Sergey Verlan. “Chocolate P Automata.” In: *Enjoying Natural Computing - Essays Dedicated to Mario de Jesús Pérez-Jiménez on the Occasion of His 70th Birthday* Lecture Notes in Computer Science, vol. 11270 (2018). Ed. by Carmen Graciani Díaz, Agustín Riscos-Núñez, Gheorghe Paun, Grzegorz Rozenberg, and Arto Salomaa, pp. 1–20.
- [j20] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, Marion Oswald, and Sergey Verlan. “Extended spiking neural P systems with white hole rules and their red-green variants.” In: *Nat. Comput.* 17.2 (2018), pp. 297–310.
- [j21] **Sergiu Ivanov**, Vladimir Rogojin, Sepinoud Azimi, and Ion Petre. “WEBRSIM: A Web-Based Reaction Systems Simulator.” In: *Enjoying Natural Computing - Essays Dedicated to Mario de Jesús Pérez-Jiménez on the Occasion of His 70th Birthday* Lecture Notes in Computer Science, vol. 11270 (2018). Ed. by Carmen Graciani Díaz, Agustín Riscos-Núñez, Gheorghe Paun, Grzegorz Rozenberg, and Arto Salomaa, pp. 170–181.
- [j22] Artiom Alhazov, Henning Fernau, Rudolf Freund, **Sergiu Ivanov**, Rani Siromoney, and K. G. Subramanian. “Contextual array grammars with matrix control, regular control languages, and tissue P systems control.” In: *Theor. Comput. Sci.* 682 (2017), pp. 5–21.
- [j23] **Sergiu Ivanov** and Sergey Verlan. “Universality and Computational Completeness of Controlled Leftist Insertion-Deletion Systems.” In: *Fundam. Informaticae* 155.1-2 (2017), pp. 163–185.
- [j24] Aaron Meurer, Christopher P. Smith, Mateusz Paprocki, Ondrej Certík, Sergey B. Kirpichev, Matthew Rocklin, Amit Kumar, **Sergiu Ivanov**, Jason Keith Moore, Sartaj Singh, Thilina Rathnayake, Sean Vig, Brian E. Granger, Richard P. Muller, Francesco Bonazzi, Harsh Gupta, Shivam Vats, Fredrik Johansson, Fabian Pedregosa, Matthew J. Curry, Andy R. Terrel, Stepán Roucka, Ashutosh Saboo, Isuru Fernando, Sumith Kulal, Robert Cimrman, and Anthony M. Scopatz. “SymPy: symbolic computing in Python.” In: *PeerJ Comput. Sci.* 3 (2017), e103.
- [j25] Artiom Alhazov, **Sergiu Ivanov**, Elisabeth Pelz, and Sergey Verlan. “Small Universal Deterministic Petri Nets with Inhibitor Arcs.” In: *J. Autom. Lang. Comb.* 21.1-2 (2016), pp. 7–26.

- [j26] Sepinoud Azimi, Cristian Gratie, **Sergiu Ivanov**, Luca Manzoni, Ion Petre, and Antonio E. Porreca. “Complexity of model checking for reaction systems.” In: *Theor. Comput. Sci.* 623 (2016), pp. 103–113.
- [j27] Rudolf Freund, **Sergiu Ivanov**, and Ludwig Staiger. “Going Beyond Turing with P Automata: Regular Observer ω -Languages and Partial Adult Halting.” In: *Int. J. Unconv. Comput.* 12.1 (2016), pp. 51–69.
- [j28] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Marion Oswald. “Observations on P Systems with States.” In: *Multidisciplinary Creativity* (2015), pp. 17–28.
- [j29] Sepinoud Azimi, Cristian Gratie, **Sergiu Ivanov**, and Ion Petre. “Dependency graphs and mass conservation in reaction systems.” In: *Theor. Comput. Sci.* 598 (2015), pp. 23–39.
- [j30] **Sergiu Ivanov**. “Annotation on PhD Thesis.” In: *Comput. Sci. J. Moldova* 23.3 (2015), pp. 386–388.
- [j31] **Sergiu Ivanov** and Sergey Verlan. “On the Lower Bounds for Leftist Insertion-Deletion Languages.” In: *Annals of the University of Bucharest (Informatics)* LXII(2) (2015), pp. 77–88.
- [j32] **Sergiu Ivanov** and Sergey Verlan. “Random Context and Semi-conditional Insertion-deletion Systems.” In: *Fundam. Informaticae* 138.1-2 (2015), pp. 127–144.
- [j33] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “Length P Systems.” In: *Fundam. Informaticae* 134.1-2 (2014), pp. 17–37.
- [j34] **Sergiu Ivanov**, Yurii Rogozhin, and Sergey Verlan. “Small Universal Networks of Evolutionary Processors.” In: *J. Autom. Lang. Comb.* 19.1-4 (2014), pp. 133–144.
- [j35] **Sergiu Ivanov**. “A formal framework for clock-free networks of cells.” In: *Int. J. Comput. Math.* 90.4 (2013), pp. 776–788.
- [j36] **Sergiu Ivanov**. “Static and Dynamic Membrane Structures.” In: *Comput. Sci. J. Moldova* 20.3 (2012), pp. 374–402.
- [j37] **Sergiu Ivanov**, Artiom Alhazov, Vladimir Rogojin, and Miguel A. Gutiérrez-Naranjo. “Forward and Backward Chaining with P Systems.” In: *Int. J. Nat. Comput. Res.* 2.2 (2011), pp. 56–66.
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- [j39] Artiom Alhazov, Constantin Ciubotaru, **Sergiu Ivanov**, and Yurii Rogozhin. “Membrane Systems Languages Are Polynomial-Time Parsable.” In: *Comput. Sci. J. Moldova* 18.2 (2010), pp. 139–148.

Conference proceedings

- [c1] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “P versus B: P Systems as a Formal Framework for Controllability of Boolean Networks.” In: *Proceedings 12th International Workshop on Non-Classical Models of Automata and Applications, NCMA 2022, Debrecen, Hungary, August 26-27, 2022*. Ed. by Henning Bordihn, Géza Horváth, and György Vaszil. Vol. 367. EPTCS. 2022, pp. 28–48.

- [c2] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Prescribed Teams of Rules Working on Several Objects.” In: *Machines, Computations, and Universality - 9th International Conference, MCU 2022, Debrecen, Hungary, August 31 - September 2, 2022, Proceedings*. Ed. by Jérôme Durand-Lose and György Vaszil. Vol. 13419. Lecture Notes in Computer Science. Springer, 2022, pp. 27–41.
- [c3] Rémi Segretain, Laurent Trilling, Nicolas Glade, and **Sergiu Ivanov**. “Who Plays Complex Music? On the Correlations Between Structural and Behavioral Complexity Measures in Sign Boolean Networks.” In: *21st IEEE International Conference on Bioinformatics and Bioengineering, BIBE 2021, Kragujevac, Serbia, October 25-27, 2021*. IEEE, 2021, pp. 1–6.
- [c4] Rémi Segretain, **Sergiu Ivanov**, Laurent Trilling, and Nicolas Glade. “A Methodology for Evaluating the Extensibility of Boolean Networks’ Structure and Function.” In: *Complex Networks & Their Applications IX - Volume 2, Proceedings of the Ninth International Conference on Complex Networks and Their Applications, COMPLEX NETWORKS 2020, 1-3 December 2020, Madrid, Spain*. Ed. by Rosa M. Benito, Chantal Cherifi, Hocine Cherifi, Esteban Moro, Luis Mateus Rocha, and Marta Sales-Pardo. Vol. 944. Studies in Computational Intelligence. Springer, 2020, pp. 372–385.
- [c5] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “Register machines over groups.” In: *Eleventh Workshop on Non-Classical Models of Automata and Applications, NCMA 2019, Valencia, Spain, July 2-3, 2019*. Ed. by Rudolf Freund, Markus Holzer, and José M. Sempere. Österreichische Computer Gesellschaft, 2019, pp. 31–46.
- [c6] Jérémie Pardo, **Sergiu Ivanov**, and Franck Delaplace. “Sequential Reprogramming of Biological Network Fate.” In: *Computational Methods in Systems Biology - 17th International Conference, CMSB 2019, Trieste, Italy, September 18-20, 2019, Proceedings*. Ed. by Luca Bortolussi and Guido Sanguinetti. Vol. 11773. Lecture Notes in Computer Science. Springer, 2019, pp. 20–41.
- [c7] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “P Systems with Activation and Blocking of Rules.” In: *Unconventional Computation and Natural Computation - 17th International Conference, UCNC 2018, Fontainebleau, France, June 25-29, 2018, Proceedings*. Ed. by Susan Stepney and Sergey Verlan. Vol. 10867. Lecture Notes in Computer Science. Springer, 2018, pp. 1–15.
- [c8] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “Sequential Grammars with Activation and Blocking of Rules.” In: *Machines, Computations, and Universality - 8th International Conference, MCU 2018, Fontainebleau, France, June 28-30, 2018, Proceedings*. Ed. by Jérôme Durand-Lose and Sergey Verlan. Vol. 10881. Lecture Notes in Computer Science. Springer, 2018, pp. 51–68.
- [c9] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “Tissue P Systems with Point Mutation Rules.” In: *Membrane Computing - 19th International Conference, CMC 2018, Dresden, Germany, September 4-7, 2018, Revised Selected Papers*. Ed. by Thomas Hinze, Grzegorz Rozenberg, Arto Salomaa, and Claudio Zandron. Vol. 11399. Lecture Notes in Computer Science. Springer, 2018, pp. 33–56.
- [c10] Artiom Alhazov, Rudolf Freund, and **Sergiu Ivanov**. “Hierarchical P Systems with Randomized Right-Hand Sides of Rules.” In: *Membrane Computing - 18th International Conference, CMC 2017, Bradford, UK, July 25-28, 2017, Revised Selected Papers*. Ed. by Marian Gheorghe, Grzegorz Rozenberg, Arto Salomaa, and Claudio Zandron. Vol. 10725. Lecture Notes in Computer Science. Springer, 2017, pp. 15–39.

- [c11] Artiom Alhazov, Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “(Tissue) P Systems with Vesicles of Multisets.” In: *Proceedings 15th International Conference on Automata and Formal Languages, AFL 2017, Debrecen, Hungary, September 4-6, 2017*. Ed. by Erzsébet Csuhaaj-Varjú, Pál Dömösi, and György Vaszil. Vol. 252. EPTCS. 2017, pp. 11–25.
- [c12] Quoc-Trung Vuong, Roselyne J. Chauvin, **Sergiu Ivanov**, Nicolas Glade, and Laurent Trilling. “A Logical Constraint-based Approach to Infer and Explore Diversity and Composition in Thresholded Boolean Automaton Networks.” In: *Complex Networks & Their Applications VI - Proceedings of Complex Networks 2017 (The Sixth International Conference on Complex Networks and Their Applications), COMPLEX NETWORKS 2017, Lyon, France, November 29 - December 1, 2017*. Ed. by Chantal Cherifi, Hocine Cherifi, Márton Karsai, and Mirco Musolesi. Vol. 689. Studies in Computational Intelligence. Springer, 2017, pp. 567–579.
- [c13] Artiom Alhazov, Bogdan Aman, Rudolf Freund, and **Sergiu Ivanov**. “Simulating R Systems by P Systems.” In: *Membrane Computing - 17th International Conference, CMC 2016, Milan, Italy, July 25-29, 2016, Revised Selected Papers*. Ed. by Alberto Leporati, Grzegorz Rozenberg, Arto Salomaa, and Claudio Zandron. Vol. 10105. Lecture Notes in Computer Science. Springer, 2016, pp. 51–66.
- [c14] Artiom Alhazov, Omar Belingheri, Rudolf Freund, **Sergiu Ivanov**, Antonio E. Porreca, and Claudio Zandron. “Purely Catalytic P Systems over Integers and Their Generative Power.” In: *Membrane Computing - 17th International Conference, CMC 2016, Milan, Italy, July 25-29, 2016, Revised Selected Papers*. Ed. by Alberto Leporati, Grzegorz Rozenberg, Arto Salomaa, and Claudio Zandron. Vol. 10105. Lecture Notes in Computer Science. Springer, 2016, pp. 67–82.
- [c15] Rudolf Freund, **Sergiu Ivanov**, and Ludwig Staiger. “Going Beyond Turing with P Automata: Partial Adult Halting and Regular Observer ω -Languages.” In: *Unconventional Computation and Natural Computation - 14th International Conference, UCNC 2015, Auckland, New Zealand, August 30 - September 3, 2015, Proceedings*. Ed. by Cristian S. Calude and Michael J. Dinneen. Vol. 9252. Lecture Notes in Computer Science. Springer, 2015, pp. 169–180.
- [c16] Rudolf Freund, **Sergiu Ivanov**, and Sergey Verlan. “P Systems with Generalized Multisets Over Totally Ordered Abelian Groups.” In: *Membrane Computing - 16th International Conference, CMC 2015, Valencia, Spain, August 17-21, 2015, Revised Selected Papers*. Ed. by Grzegorz Rozenberg, Arto Salomaa, José M. Sempere, and Claudio Zandron. Vol. 9504. Lecture Notes in Computer Science. Springer, 2015, pp. 117–136.
- [c17] **Sergiu Ivanov** and Sergey Verlan. “Universality of Graph-controlled Leftist Insertion-deletion Systems with Two States.” In: *Machines, Computations, and Universality - 7th International Conference, MCU 2015, Famagusta, North Cyprus, September 9-11, 2015, Proceedings*. Ed. by Jérôme Durand-Lose and Benedek Nagy. Vol. 9288. Lecture Notes in Computer Science. Springer, 2015, pp. 79–93.
- [c18] **Sergiu Ivanov**. “Polymorphic P Systems with Non-cooperative Rules and No Ingredients.” In: *Membrane Computing - 15th International Conference, CMC 2014, Prague, Czech Republic, August 20-22, 2014, Revised Selected Papers*. Ed. by Marian Gheorghe, Grzegorz Rozenberg, Arto Salomaa, Petr Sosík, and Claudio Zandron. Vol. 8961. Lecture Notes in Computer Science. Springer, 2014, pp. 258–273.
- [c19] **Sergiu Ivanov**, Elisabeth Pelz, and Sergey Verlan. “Small Universal Non-deterministic Petri Nets with Inhibitor Arcs.” In: *Descriptional Complexity of Formal Systems - 16th International Workshop, DCFS 2014, Turku, Finland, August 5-8, 2014, Proceedings*. Ed. by Helmut Jürgensen, Juhani Karhumäki, and Alexander Okhotin. Vol. 8614. Lecture Notes in Computer Science. Springer, 2014, pp. 186–197.

- [c20] Henning Fernau, Rudolf Freund, **Sergiu Ivanov**, Markus L. Schmid, and K. G. Subramanian. “Array Insertion and Deletion P Systems.” In: *Unconventional Computation and Natural Computation - 12th International Conference, UCNC 2013, Milan, Italy, July 1-5, 2013. Proceedings*. Ed. by Giancarlo Mauri, Alberto Dennunzio, Luca Manzoni, and Antonio E. Porreca. Vol. 7956. Lecture Notes in Computer Science. Springer, 2013, pp. 67–78.
- [c21] Rudolf Freund, **Sergiu Ivanov**, Marion Oswald, and K. G. Subramanian. “One-dimensional Array Grammars and P Systems with Array Insertion and Deletion Rules.” In: *Proceedings Machines, Computations and Universality 2013, MCU 2013, Zürich, Switzerland, September 9-11, 2013*. Ed. by Turlough Neary and Matthew Cook. Vol. 128. EPTCS. 2013, pp. 62–75.
- [c22] **Sergiu Ivanov** and Sergey Verlan. “About One-Sided One-Symbol Insertion-Deletion P Systems.” In: *Membrane Computing - 14th International Conference, CMC 2013, Chişinău, Republic of Moldova, August 20-23, 2013, Revised Selected Papers*. Ed. by Artiom Alhazov, Svetlana Cojocaru, Marian Gheorghe, Yurii Rogozhin, Grzegorz Rozenberg, and Arto Salomaa. Vol. 8340. Lecture Notes in Computer Science. Springer, 2013, pp. 225–237.
- [c23] **Sergiu Ivanov**. “Basic Concurrency Resolution in Clock-Free P Systems.” In: *Membrane Computing - 12th International Conference, CMC 2011, Fontainebleau, France, August 23-26, 2011, Revised Selected Papers*. Ed. by Marian Gheorghe, Gheorghe Paun, Grzegorz Rozenberg, Arto Salomaa, and Sergey Verlan. Vol. 7184. Lecture Notes in Computer Science. Springer, 2011, pp. 226–242.
- [c24] Artiom Alhazov, Constantin Ciubotaru, **Sergiu Ivanov**, and Yurii Rogozhin. “The Family of Languages Generated by Non-cooperative Membrane Systems.” In: *Membrane Computing - 11th International Conference, CMC 2010, Jena, Germany, August 24-27, 2010. Revised Selected Papers*. Ed. by Marian Gheorghe, Thomas Hinze, Gheorghe Paun, Grzegorz Rozenberg, and Arto Salomaa. Vol. 6501. Lecture Notes in Computer Science. Springer, 2010, pp. 65–80.
- [c25] Artiom Alhazov, **Sergiu Ivanov**, and Yurii Rogozhin. “Polymorphic P Systems.” In: *Membrane Computing - 11th International Conference, CMC 2010, Jena, Germany, August 24-27, 2010. Revised Selected Papers*. Ed. by Marian Gheorghe, Thomas Hinze, Gheorghe Paun, Grzegorz Rozenberg, and Arto Salomaa. Vol. 6501. Lecture Notes in Computer Science. Springer, 2010, pp. 81–94.

Theses

- [t1] **Sergiu Ivanov**. “On the Power and Universality of Biologically-inspired Models of Computation. (Étude de la puissance d’expression et de l’universalité des modèles de calcul inspirés par la biologie).” PhD thesis. University of Paris-Est, France, 2015.

Posters

1. Poster **Small Universal Petri Nets with Inhibitor Arcs** at the AÉRES evaluation of the LACL laboratory, Université Paris Est Créteil (Dec 2013).

Invited talks and seminars

1. Invited talk **P Systems with Reactive Membranes** at the Workshop on Intelligent Information Systems WIIS 2023, at the Institute of Mathematics and Computer Science “Vladimir Andrunachievici” (Oct 19–21, 2023).
2. Seminar **Queens of the Hill** at the LACL laboratory, Université Paris Est Créteil (Oct 9, 2023).

3. SIANA⁵ public round table **Stakes of digital innovations for the society** (*Enjeux sociétaux des innovations numériques*) at the Corbeil-Essonnes theater (Feb 2, 2023).
4. Invited talk **The Many Shapes of Polymorphism** at the Conference on Membrane Computing (Trieste, Italy) and the Asian Conference on Membrane Computing (online) (Sep 5–9, 2022).
5. Seminar **P vs. B: P Systems as a Formal Framework for Controllability of Boolean Networks** at the TIMC laboratory, Université Grenoble-Alpes (Jun 7, 2022).
6. Invited talk **Sequential Reprogramming of Biological Network Fate** at the special session “Complex systems” of the Finnish Mathematical Days 2022 (Jan 5, 2022).
7. Seminar **Sequential Reprogramming of Biological Network Fate** at the University of Turku, Finland (May 28, 2019).
8. Seminar **Universality and Computational Completeness of Controlled Leftist Insertion-deletion Systems** at the LIFO laboratory, Université d’Orléans (Feb 6, 2017).
9. Seminar **Semilinear Sets, Register Machines, and Integer Vector Addition (P) Systems** at the LACL laboratory, Université Paris Est Créteil (Jan 16, 2017).
10. Online invited talk **Semilinear Sets, Register Machines, and Integer Vector Addition (P) Systems** at the Yurii ROGOZHIN seminar series, Institute of Mathematics and Computer Science “Vladimir Andrunachievici” (Nov 11, 2016).
11. Seminar **Theory of Computer Science: Why All That Formal Stuff?** at the Tekwill Center of Excellence, Chişinău, Moldova (Dec 15, 2016).
12. Seminar **Formal Instruments for Adverse Computations** at the LORIA laboratory, Université de Lorraine (Mar 25, 2016).
13. Seminar **Complexity of Model Checking for Reaction Systems** at the i3S laboratory, Université Côte d’Azur (Mar 24, 2016).
14. Seminar **On the Power and Universality of Biologically-inspired Models of Computation** at the LIF laboratory, Aix-Marseille Université (Mar 7, 2016).
15. Seminar **Small Universal Petri Nets: Biochemical Universality** at the LIFO laboratory, Université d’Orléans (Feb 22, 2016).
16. Seminar **Some Results on Leftist Insertion-deletion Systems** at the LSV laboratory (now LMF), ENS Cachan (Nov 25, 2015).
17. Online invited talk **Some Results on Leftist Insertion-deletion Systems** at the Yurii ROGOZHIN seminar series, Institute of Mathematics and Computer Science “Vladimir Andrunachievici” (Nov 13, 2015).
18. Seminar **Variants of P Systems with Toxic Objects** at Vienna University of Technology (TU Wien) (Nov 23, 2015).
19. Seminar **Complexity of Model Checking for Reaction Systems** at the Combio laboratory, Åbo Akademi, Turku, Finland (Oct 2, 2014).
20. Seminar **Model Checking of Reaction Systems: Work in Progress** at the Combio laboratory, Åbo Akademi, Turku, Finland (May 25, 2014).
21. Seminar **Bridging Programming, Natural Computing, Formal Languages, and Petri Nets** at the Combio laboratory, Åbo Akademi, Turku, Finland (Apr 14, 2014).
22. Seminar **Small Universal Petri Nets** at the LACL laboratory, Université Paris Est Créteil (Jan 27, 2014).

⁵SIANA is an association defining itself as an “Artistic laboratory, and a pool of digital and hybrid resources of the Essonne department, and the south of Île-de-France.”

14 Research visits

Apr–Aug 2024	Damien WOODS	TAPDANCE, Maynooth University, Ireland
Aug 2023	Rudolf FREUND	Vienna University of Technology (TU Wien), Austria
Jun 2022	Nicolas GLADE	Université Grenoble-Alpes, France
Jun 2022	Nicolas SCHABANEL	ENS Lyon, France
Aug 2021	Rudolf FREUND	Vienna University of Technology (TU Wien), Austria
Jun 2021	Nicolas GLADE	Université Grenoble-Alpes, France
Feb 2020	Nicolas GLADE	Université Grenoble-Alpes, France
May 2019	Nicolas GLADE	Université Grenoble-Alpes, France
May 2019	Ion PETRE	University of Turku, Finland
Aug 2017	Rudolf FREUND	Vienna University of Technology (TU Wien), Austria
Aug 2016	Rudolf FREUND	Vienna University of Technology (TU Wien), Austria
Jan 2016	Ion PETRE	Combio, Åbo Akademi, Turku, Finlande
Aug 2015	Rudolf FREUND	Vienna University of Technology (TU Wien), Austria
Oct 2014	Ion PETRE	Combio, Åbo Akademi, Turku, Finlande
Apr–May 2014	Ion PETRE	Combio, Åbo Akademi, Turku, Finlande
Aug 2011	Sergey VERLAN	LACL, Université Paris-Est Créteil