

Curriculum vitæ Sergey Kirgizov

Born 5th June, 1988

Married, with five children

Languages : Russian, French and English

Academic Positions

- Maître de conférences (Associate Professor), Université Bourgogne Europe, 2019–present
- Research and Teaching Fellow (Vacataire), Université de Bourgogne, 2018-2019
- Research and Teaching Fellow (ATER), Université de Bourgogne, 2015-2017
- Postdoc Research Fellow, Université de Bourgogne, 2014-2015

Industry Positions

- R&D engineer, Page Up, Dijon, Paris, France, 2017-2019
- Software engineer and architect, Scientific Saas, Barnaul, Russia, 2010-2013
- Software engineer and team leader, Altay State University, Barnaul, Russia 2007-2010
- Web-site administrator, Barnaul, Russia, 2009
- System and network administrator, Barnaul, Russia, 2006-2007

Education

- PhD in Computer Science, Université Pierre et Marie Curie, 2011-2014
- Master degree in Applied Mathematics and Informatics, Altay State University, 2009-2011
- Master Internship 2, Université Pierre et Marie Curie, 2011
- Master Internship 1, Université Pierre et Marie Curie, 2010
- B.S. in Mathematics, Altay State University, 2005-2009
- Lyceum of Information Technologies “Kvant”, Barnaul, Russia, 2003-2005

Research projects

- Participant of the ANR “COMETA-GAE, Enumerative combinatorics and applications : random and exhaustive generation”, 2025-2030
- Project leader of the ANR “PICS — Patterns in Combinatorics”, 2022-2026
- Project leader of the “Artico — L’ART de la COmbinatoire et ses Interactions”, Bourgogne-Franche-Comté region, 2021-2023
- Participant of the ANR “COREGRAPHIE”, 2021-2025
- Principal participant of the PEPS MoMIS SEISME, 2015-2016
- Participant of the “TEE 2014” project
- Participant of the ANR “DynGraph”, 2010-2013
- Participant of the FP7 FIRE project EULER, 2010-2014
- Participant of the project funded by EIT-ICT Labs action line FNS, 2014

Distinctions

- Best Start-Up award. Our start-up “Scientific Saas” won the competition “IT-Start”, 2012
- Best Paper Award, The Seventh International Conference on Autonomic and Autonomous Systems, ICAS, 2011
- Prize “For the fastest solution of the most difficult task”, All-Russia Oracle Database Olympiad, 2009
- Scholarship for Excellence in Studies, 2009-2011
- Gold Medal for Excellence in Studies, 2005
- Barnaul City Mayor’s Special Scholarship for Excellence in Studies, 2004-2005

PhD Students

- Abdelhamid Garah, “Gestion autonome des services de sécurité dans l’Internet des objets”, joint supervision with Nader Mbarek, Université de Bourgogne, 2021-2024
- Rémi Maréchal, “Combinatoire énumérative et bijective de différentes familles de chemins de Dyck avec trous d’air”, joint supervision with Jean-Luc Baril and Vincent Vajnovszki, Université de Bourgogne, 2021-2024
- Nathanaël Hassler, “Motifs dans les Permutations et les Mots”, joint supervision with Jean-Luc Baril and Vincent Vajnovszki, Université de Bourgogne, 2023-ongoing

Postdocs

- Célia Biane, ANR “PICS — Patterns in Combinatorics” project, 2023-2024
- Khaydar Nurligareev, ANR “PICS — Patterns in Combinatorics” project, 2023-2024

Organization of Conferences

- Les 26e Journées Graphes et Algorithmes (JGA), 2024
- 21th International Conference on Permutation Patterns, 2023
- 16th International Conference on Signal Image Technology & Internet based Systems, SITIS, 2022
- 7th Workshop on Complex Networks, CompleNet, 2016
- ALGOTEL conference, 2015
- MARAMI conference, 2014
- Journée thématique "Dynamique des graphes", 2012
- Journées Automnales 2012 ResCom à Paris 6

Administrative responsibilities

- Member of the Bureau de la Commission de Proposition (BCP) of section 27 of the University of Burgundy, since 2023
- Member of the LIB laboratory council, since 2023
- Co-organiser of LIB laboratory seminars, since 2022
- Coordinator of internship for 4th year internships at Polytech Dijon, Computer Science and Electronics Department, since 2021
- Member of the Polytech Dijon School Council, since 2021
- Member of the Polytech Dijon Orientation Council, since 2021
- Coordinator of student projects for the 4th year of Polytech Dijon, Computer Science and Electronics Department, Since 2020

Other activities

- Participation in art-science exhibitions :
 - *Les concepts mathématiques vus par Yulia Kirgizova*. “Le Cortex” library of the University of Burgundy, 2023
 - *Les Réseautantes*. Travelling exhibition : Darcy garden, secondary schools in the BFC region, “Le Cortex” library, 2020-2022
 - *Résomes*. The Atheneum, Cultural Centre of the University of Burgundy, 2020
- Founder of Papers⁷ — discussing board for scientific papers.
- Reviewer for
FPSAC ; The Electronic Journal of Combinatorics ; Discrete Mathematics ; SIAM Journal on Discrete Mathematics ; CPM 2025 : 36th Annual Symposium on Combinatorial Pattern

Matching; The Australasian Journal of Combinatorics; GASCom; ALGOTEL; IEEE Communications Letters; CompleNet; International Journal of Computer Mathematics; Journal of Algebraic Combinatorics; Journal of Automata, Languages and Combinatorics; Discrete Mathematics & Theoretical Computer Science; Integers; Annales Mathematicae Silesianae; Filomat; Computing in Geometry and Topology; Fibonacci Quarterly; Journal of Integer Sequences; Symposium on Computers and Communications; Conference on Standards for Communications and Networking; Discrete Mathematics Letters; RAIRO Informatique théorique et applications, Theoretical Informatics and Applications

Contact Information

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Site web : <https://kirgizov.link>

Publications

International Scientific Journals (32)

1. **Structure and growth of \mathbb{R} -bonacci words**

Sergey Dovgal and Sergey Kirgizov

The Electronic Journal of Combinatorics, 32(3), Article P3.32, 2025

2. **A lattice on Dyck paths close to the Tamari lattice**

Jean-Luc Baril, Sergey Kirgizov and Mehdi Naima

In memory of Jean Pallo

Séminaire Lotharingiens de Combinatoire, 89, 2025

3. **The ascent lattice on Dyck paths**

Jean-Luc Baril, Mireille Bousquet-Mélou, Sergey Kirgizov, and Mehdi Naima

The Electronic Journal of Combinatorics, 32(2), P2.36, 2025

4. **Asymptotics of self-overlapping permutations**

Sergey Kirgizov and Khaydar Nurligareev

Discrete Mathematics, 348(5), 2025

5. **Endhered patterns in matchings and RNA**

Célia Biane, Greg Hampikian, Sergey Kirgizov, and Khaydar Nurligareev

Journal of Computational Biology, 32(1), 2025

6. **The combinatorics of Motzkin polyominoes**

Jean-Luc Baril, Sergey Kirgizov, José Luis Ramírez, and Diego Villamizar

Discrete Applied Mathematics, 364, 2025

7. **Grand zigzag knight's paths**

Jean-Luc Baril, Nathanaël Hassler, Sergey Kirgizov and José Luis Ramírez

Enumerative combinatorics and applications, 5(1), 2025

8. **Enhancing IoT data confidentiality and energy efficiency through decision tree-based self-management**
Abdelhamid Garah, Nader Mbarek, and Sergey Kirgizov
Internet of Things, 26, 2024
9. **Grand Dyck paths with air pockets**
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal, and Vincent Vajnovszki
The Art of Discrete and Applied Mathematics, 7(1), 2023
10. **Enumeration of Dyck Paths with Air Pockets**
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal, and Vincent Vajnovszki
Journal of Integer Sequences, 26(3), 2023
11. **Q-bonacci words and numbers**
Sergey Kirgizov
The Fibonacci Quarterly, 60(5), 2022
12. **Polyominoes and graphs built from Fibonacci words**
Sergey Kirgizov and José Luis Ramírez
The Fibonacci Quarterly, 60(5), 2022
13. **Dyck paths with catastrophes modulo the positions of a given pattern**
Jean-Luc Baril, Sergey Kirgizov, Armen Petrossian
Australasian Journal of Combinatorics, 84(3), 2022
14. **Asymptotic bit frequency in Fibonacci words**
Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki
Pure Mathematics and Applications, 30(1), 2022
15. **Gray codes for Fibonacci q -decreasing words**
Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki
Theoretical Computer Science, 927, Pages 120-132, 2022
16. **Lattice paths with a first return decomposition constrained by the maximal height of a pattern**
Jean-Luc Baril and Sergey Kirgizov
Discrete Mathematics Letters, 8, 2022
17. **Pattern statistics in faro words and permutations**
Jean-Luc Baril, Alexander Burstein and Sergey Kirgizov
Discrete Mathematics, 344(8), 2021
18. **Bijections from Dyck and Motzkin meanders with catastrophes to pattern avoiding Dyck paths**
Jean-Luc Baril and Sergey Kirgizov
Discrete Mathematics Letters, 7, 2021
19. **Transformation à la Foata for special kinds of descents and excedances**
Jean-Luc Baril and Sergey Kirgizov
Enumerative Combinatorics and Applications, ECA 1 :3, Article S2R19, 2021
20. **Pattern distributions in Dyck paths with a first return decomposition constrained by height**
Jean-luc Baril, Richard Genestier and Sergey Kirgizov
Discrete Mathematics, 343(9), 2020

21. **Bijections between directed animals, multisets and Grand-Dyck paths**
Jean-luc Baril, David Bevan and Sergey Kirgizov
The Electronic Journal of Combinatorics, 27(2), Article P2.10, 2020
22. **Motzkin paths with a restricted first return decomposition**
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian
INTEGERS, 19, 2019
23. **Enumeration of Lukasiewicz paths modulo some patterns**
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian
Discrete Mathematics, 342(4), 2019
24. **Descent distribution on Catalan words avoiding a pattern of length at most three**
Jean-luc Baril, Sergey Kirgizov and Vincent Vajnovszki
Discrete Mathematics, 341(9), Pages 2608-2615, 2018
25. **Dyck paths with a first return decomposition constrained by height**
June 2017, Jean-luc Baril, Sergey Kirgizov and Armen Petrossian
Discrete Mathematics, 341(6), Pages 1620-1628, 2018
26. **Forests and pattern avoiding permutations modulo pure descents**
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian
Pure Mathematics and Applications (PUMA), 27(1), 2018
27. **Patterns in treeshelves**
Jean-luc Baril, Sergey Kirgizov and Vincent Vajnovszki
Discrete Mathematics, 340 (12), Pages 2946-2954, 2017
28. **The pure descent statistic on permutations**
Jean-luc Baril, Sergey Kirgizov *Discrete Mathematics*, 340 (10), Pages 2550-2558, 2017
29. **Information fusion-based approach for studying influence on twitter using belief theory**
Lobna Azaza, Sergey Kirgizov, Marinette Savonnet, Éric Leclercq, Nicolas Gastineau, and Rim Faiz
Computational Social Networks, 3, 2016, pp. 1–26, 2016
30. **The complexity of deciding whether a graph admits an orientation with fixed weak diameter**
Julien Bensmail, Romaric Duvignau, Sergey Kirgizov
Discrete Mathematics and Theoretical Computer Science (DMTCS), 17(3) :31-42, 2016.
31. **Suppression Distance Computation for Set Covers and Hierarchies**
François Queyroi and Sergey Kirgizov
Information Processing Letters, 115.9 (2015) : 689-693, 2015
32. **Towards realistic modeling of IP-level routing topology dynamics**
Clémence Magnien, Amélie Medem, Sergey Kirgizov and Fabien Tarissan
Networking Science, 3 (1-4), pp.24-33, 2013

French Scientific Journals (2)

1. **Évaluation de l'influence polarisée dans un réseau multi-relationnel : application à twitter**

Lobna Azaza, Marinette Savonnet, Eric Leclercq, Sergey Kirgizov, and Rim Faiz
Revue Document Numérique, 2017/1 (Vol. 20)

2. **Un observatoire pour la modélisation et l’analyse des réseaux multirelationnels : une application à l’étude du discours politique sur twitter**

Ian Basaille, Sergey Kirgizov, Éric Leclercq, Marinette Savonnet, Nadine Cullot, Thierry Grison, and Elisabeth Gavignet
Revue Document Numérique, 2017/1 (Vol. 20)

Book chapters (1)

1. **Tweets from the Campaign Trail : Researching Candidates’ Use of Twitter during the European Parliamentary Elections**, co-auteur du chapitre “*SNFreezer : a Platform for Harvesting and Storing Tweets in a Big Data Context*”, éditeurs Alexander Frame, Arnaud Mercier, Gilles Brachotte, and Caja Thimm. Pages 19-33. Peter Lang. 2016

Peer-Reviewed International Conferences (28)

1. **Emerging consecutive pattern avoidance**
Nathanaël Hassler and Sergey Kirgizov
Presented by Nathanaël Hassler, *Permutation Patterns*, St Andrews, Scotland, 2025
2. **Fuzzy logic-based IoT object integrity self-management**
Abdelhamid Garah, Nader Mbarek and Sergey Kirgizov
Presented by Abdelhamid Garah, *The 12th IFIP International Conference on New Technologies, Mobility and Security (NTMS)*, Paris, France, 2025.
3. **DBSCAN-based IoT object integrity self-management**
Abdelhamid Garah, Nader Mbarek and Sergey Kirgizov
Presented by Abdelhamid Garah, *The 21st International Wireless Communications & Mobile Computing Conference (IWCMC)*, Abu Dhabi, UAE, 2025
4. **Brick wall excursions**
Sergey Kirgizov, Khaydar Nurligareev, and Michael Wallner
Presented by Khaydar at *ALEA Days, Journées ALEA*, Marseille, 17-21 March, 2025
5. **Distribution of endhered patterns in RNA-related secondary structures**
Célia Biane, Greg Hampikian, Sergey Kirgizov, Khaydar Nurligareev, and Daniel Pinson
Presented by Sk at *SeqBIM 2024*, Rennes, 28-29 November, 2024
6. **The combinatorics of Motzkin polyominoes abstract**
Jean-Luc Baril, Sergey Kirgizov, José Luis Ramírez, and Diego Villamizar
Presented by Diego Villamizar from Universidad Sergio Arboleda (Colombia)
ICECA, International Conference Enumerative Combinatorics and Applications, University of Haifa, Israel, 26-28 August, 2024
7. **Asymptotics of endhered patterns in perfect matchings**
Célia Biane, Khaydar Nurligareev, and Sergey Kirgizov
Presented by Khaydar at *ALEA Days, Journées ALEA*, Marseille, March 11-15, 2024
8. **Grand zigzag knight’s paths**
Jean-Luc Baril, Nathanaël Hassler, Sergey Kirgizov and José Luis Ramírez
Presented by Nathanaël at *ALEA Days, Journées ALEA*, Marseille, March 11-15, 2024

9. **A lattice on Dyck paths close to the Tamari Lattice**
Jean-Luc Baril, Sergey Kirgizov and Mehdi Naima
Presented by Mehdi at *Computational Logic and Applications*, Jagiellonian University, Kraków, December 14-15, 2023
10. **IoT Data Confidentiality Self-Management**
Abdelhamid Garah, Nader Mbarek and Sergey Kirgizov
Presented by Abdelhamid at IEEE DASC, Abu Dhabi, UAE, November 14-17, 2023
11. **Decision Tree-Based Confidentiality Self-Management in the Internet of Things**
Abdelhamid Garah, Nader Mbarek, and Sergey Kirgizov
Presented by Nader at LCN 2023, Daytona Beach, Florida, USA, October 1-5, 2023
12. **Sturm meets Fibonacci in Minkowski's fractal bar**
Sergey Dovgal and Sergey Kirgizov
Permutation Patterns 2023, Dijon, France, July 3-7, 2023
13. **An introduction to Dyck paths with air pockets**
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal and Vincent Vajnovszki
ALEA Days, Journées ALEA, March 13-17, 2023
14. **Fibonacci q-decreasing words : enumerative results and Gray codes**
Sergey Kirgizov, Jean-Luc Baril and Vincent Vajnovszki
AUA-UAEU Workshop on Graph Theory, Combinatorics and Applications (GTCA), Al Ain, UAE, November 13-15, 2022
15. **An Architecture for Confidentiality Self-management in the Internet of Things**
Abdelhamid Garah, Nader Mbarek, and Sergey Kirgizov
International Workshop on IoT Security and Quality of Service, SITIS 2022, 21 October, 2022
16. **Q-bonacci words and numbers**
Sergey Kirgizov
The Twentieth International Conference on Fibonacci Numbers and Their Applications, Sarajevo, Bosnia and Herzegovina, 25-29 July, 2022
17. **Asymptotic bit frequency in Fibonacci words**
Sergey Kirgizov, Jean-Luc Baril and Vincent Vajnovszki
GASCom 2022, Villa Toeplitz, Varese, Italy, June 13-15, 2022
18. **Clique percolation method : memory efficient almost exact communities**
Alexis Baudin, Maximilien Danisch, Sergey Kirgizov, Clémence Magnien and Marwan Ghanem
17th anniversary of the International Conference on Advanced Data Mining and Applications, (ADMA '21)
Sydney, Australia, 2-4 February, 2022
19. **Qubonacci words**
Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki
Permutations patterns 2021, Virtual, University of Strathclyde, June 15-16
20. **Pattern distribution in faro words and permutations**
Jean-luc Baril and Sergey Kirgizov
Permutations patterns 2020, Virtual, Valparaiso University, June 30 and July 1
21. **Temporal density of community structure**
Sergey Kirgizov and Éric Leclercq
The 10th Conference on Network Modeling and Analysis : MARAMI, Dijon, France, 2019

22. **Pattern avoiding permutations modulo pure descents**
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian
Permutation Patterns Conference, Reykjavik University, Iceland, 2017
23. **Temporal density of complex networks and ego-community dynamics**
Sergey Kirgizov, Eric Leclercq
Annual Conference on Complex Systems (ECCS or CCS), Amsterdam, 2016
24. **Towards a Twitter Observatory : A multi-paradigm framework for collecting, storing and analysing tweets**
Ian Basaille, Sergey Kirgizov, Éric Leclercq, Marinette Savonnet, et Nadine Cullot
RCIS 2016, IEEE Tenth International Conference on Research Challenges in Information Science, Grenoble, France, 1-3 June 2016
25. **A web application for event detection and exploratory data analysis for Twitter data** Sergey Kirgizov, Eric Leclercq, Marinette Savonnet, Alexander Frame, Ian Basaille-Gahite
Twitter at the European Elections 2014 : International Perspectives on a Political Communication Tool, Dijon, 2015
26. **Influence Assessment in Twitter Multi-Relational Network** Lobna Azaza, Sergey Kirgizov, Marinette Savonnet, Éric Leclercq, Rim Faiz
Eleventh International IEEE Conference on Signal Image Technologies and Internet-Based System (SITIS), Bangkok, Thailand : 436-443, 2015
27. **On the complexity of turning a graph into the analogue of a clique**
Julien Bensmail, Romaric Duvignau, Sergey Kirgizov
9th International colloquium on graph theory and combinatorics (ICGT), 2014
28. **Using Reinforcement Learning for Autonomic Resource Allocation in Clouds : towards a fully automated workflow**
Xavier Dutreilh, Sergey Kirgizov, Olga Melekhova, Jacques Malenfant, Nicolas Rivierre, and Isis Truck
In The 7th International Conference on Autonomic and Autonomous Systems (ICAS'2011), best paper award, 2011

Peer-Reviewed French National Conferences (12)

1. **L'art et la combinatoire**
Sergey and Yulia Kirgizova
Journée Arts Design et Sciences, Dijon, 30 mai, 2024
2. **Enumeration of Dyck paths with air pockets**
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal and Vincent Vajnovszki
Poster *Les journées JNIM (Journées Nationales de l'Informatique Mathématique)*, Villeneuve d'Ascq (France), 29 mars – 1 avril, 2022
3. **Packing coloring and subsets preserving path distance**
Nicolas Gastineau, Benjamin Gras, Sergey Kirgizov, Mahmoud Omidvar
Journées Graphes et Algorithmes (JGA), Paris, 2016
4. **(Re)constituer la temporalité d'un événement médiatique sur Twitter : une étude contrastive**

Tatiana Kondrashova, Alexander Frame, and Sergey Kirgizov

XXe congrès de la SFSIC : Temps, temporalités et information-communication, 8-10 juin 2016 Metz (France)

5. **Évaluation de l'influence dans un réseau multi-relationnel : le cas de Twitter**

Lobna Azaza, Sergey Kirgizov, Marinette Savonnet, Éric Leclercq, Rim Faiz

INFORSID'2016, Le congrès INFORSID (INFormatique des ORganisations et Systèmes d'Information et de Décision), du 31 mai au 3 juin, à Grenoble, France

6. **A la recherche des mini-publics : un problème de communautés, de singularités et de sémantique**

Données participatives et sociales

Eric Leclercq, Sergey Kirgizov, Maximilien Danisch

16ème conférence francophone sur l'Extraction et la Gestion des Connaissances (EGC 2016) : l'atelier Données participatives et sociales, Reims, Janvier 2016

7. **Evaluation de l'influence sur Twitter : Application au projet "Twitter aux Elections Européennes 2014"**

Sergey Kirgizov, Lobna Azaza, Éric Leclercq, Marinette Savonnet et Alexander Frame

Journées d'étude "Etudier le Web politique : Regards croisés", Lyon, 12-13 Mai 2015

8. **Papers^γ, Discussing board for scientific papers**

Conference SO Data 3, Paris, 26 Mars 2015

9. **Internet Topology Dynamics : stochastic process estimation from partial observations**

with Clémence Magnien

Journée jointe des GDR ISIS et Phénix "Analyse et inférence pour les réseaux", Paris, 2013

10. **Distribution multimodale de la taille du sous-graphe des plus courts chemins dans un graphe aléatoire**

Journées Graphes et Algorithmes (JGA), Orsay, 2013

11. **Dynamique de la topologie de l'internet : impact de la fréquence de mesure sur les observations**

Sergey Kirgizov, Clémence Magnien, Fabien Tarissan and Azhu Liu

24ème colloque GRETSI, Brest, France, 2013

12. **Vers une modélisation réaliste de la dynamique de la topologie de routage au niveau IP**

Sergey Kirgizov, Amélie Medem, Clémence Magnien, and Fabien Tarissan

Journées Automnales 2012 ResCom, Paris, 2012

Teaching

I give lectures, organise laboratory works and student projects. I teach mostly in French, but some of the courses are in English and Russian.

- Polytech Dijon, École polytechnique universitaire de Bourgogne
Université Bourgogne Europe, 2019–current
 - Systèmes UNIX
 - Langue vivante 2, Русский язык

- Big Data
- Ingénierie des systèmes d'information
- Systèmes d'information avancés
- Hash & Crypto
- Sécurité et intégrité cryptographique des données
- Machine learning : reinforcement learning
- ESIREM, Université de Bourgogne, 2018–2019, Vacataire
 - Systèmes UNIX
 - Systèmes d'information avancés
- Université de Bourgogne, 2015-2017, ATER
 - Algorithmique avancée
 - Initiation à la programmation en Java
 - Systèmes d'exploitation
 - Langages C et C++
 - OpenMP
 - MPI
- Université de Bourgogne, from January to August 2015, Postdoc
 - Interfaces visuelles (Java)
- Université Pierre et Marie Curie, doctorant-vacataire, 2012-2014
 - Initiation à la compilation et aux machines virtuelles (Scheme et C)
 - Programmation récursive (Scheme)
 - Structures discrètes