

# Sergey Kirgizov

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5/6/1988, Married, with five children

## Languages

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Russian, French and English

## Current positions

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<b>Université de Bourgogne</b> <i>Maître de conférences, Laboratoire d'Informatique de Bourgogne (LIB)</i> Ecole Supérieure d'Ingénieurs Numérique et Matériaux (ESIREM)	<b>Dijon, France</b> 2019–present
<b>Papers<sup>γ</sup> — Discussion board for scientific papers</b> <i>Founder, <a href="https://papers-gamma.link">https://papers-gamma.link</a></i>	<b>Dijon et Paris, France</b> 2015–present

## Academic positions

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<b>Université de Bourgogne</b> <i>Research and Teaching Fellow (vacataire), Laboratoire d'Informatique de Bourgogne (LIB)</i> Ecole Supérieure d'Ingénieurs Numérique et Matériaux (ESIREM)	<b>Dijon, France</b> 2018–2019
<b>Université de Bourgogne Franche-Comté</b> <i>Research and Teaching Fellow (ATER),</i> Combinatorics & Network science	<b>Dijon, France</b> 2015–2017
<b>Université Bourgogne Franche-Comté</b> <i>Postdoc Research Fellow</i>	<b>Dijon, France</b> 2014–2015

## Previous industry positions

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<b>Page Up</b> <i>R&amp;D engineer</i>	<b>Dijon et Paris, France</b> 2017–2019
<b>Start-Up: Scientific Saas</b> <i>Software engineer and architect, Cloud Web-Applications for Data Mining</i>	<b>Barnaul, Russia</b> 2010–2013
<b>Altay State University</b> <i>Software engineer and Team Leader</i>	<b>Barnaul, Russia</b> 2007–2010
<b>Publishing House “Region”</b> <i>Web-site administrator</i>	<b>Barnaul, Russia</b> 2009
<b>Publishing House “Info-Market”</b> <i>System and network administrator</i>	<b>Barnaul, Russia</b> 2006–2007

## Education

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<b>Université Pierre et Marie Curie</b> <i>PhD in Computer Science</i>	<b>Paris, France</b> 2011–2014
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Thesis: "Empirical analysis and modeling of the Internet topology dynamics"	
<b>Altay State University</b>	<b>Barnaul, Russia</b>
<i>Master degree in Applied Mathematics and Informatics</i>	<i>2009–2011</i>
Thesis: "Data mining as a service, The workflow model"	
<b>Université Pierre et Marie Curie</b>	<b>Paris, France</b>
<i>Master 2 Training</i>	<i>Apr–Sep 2011</i>
Thesis: "Software architectures for decision and coordination in autonomic computing"	
<b>Université Pierre et Marie Curie</b>	<b>Paris, France</b>
<i>Master Training</i>	<i>Jun–Dec 2010</i>
Thesis: "Tools for the autonomic management of resources in virtualized data centers"	
<b>Altay State University</b>	<b>Barnaul, Russia</b>
<i>B.S. in Mathematics</i>	<i>2005–2009</i>
<b>Lyceum of Information Technologies "Kvant"</b>	<b>Barnaul, Russia</b>
<i>Thesis: "Search system for Intranet site"</i>	<i>2003–2005</i>

## Honors and awards

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

## Publications

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### International Scientific Journals (24)

- Grand Dyck paths with air pockets**  
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal, and Vincent Vajnovszki  
*The Art of Discrete and Applied Mathematics*, 2023.
- Enumeration of Dyck Paths with Air Pockets**  
Jean-Luc Baril, Sergey Kirgizov, Rémi Maréchal, and Vincent Vajnovszki  
*Journal of Integer Sequences*, 26(3), Mars 2023.
- $\mathbb{Q}$ -bonacci words and numbers**  
Sergey Kirgizov  
*The Fibonacci Quarterly*, 60(5), December 2022.
- Polyominoes and graphs built from Fibonacci words**  
Sergey Kirgizov and José Luis Ramírez  
*The Fibonacci Quarterly*, 60(5), December 2022.
- Dyck paths with catastrophes modulo the positions of a given pattern**  
Jean-Luc Baril, Sergey Kirgizov, Armen Petrossian  
*Australasian Journal of Combinatorics*, Volume 84, Issue 3, 2022
- Asymptotic bit frequency in Fibonacci words**  
Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki

*Pure Mathematics and Applications*, Volume 30, Issue 1, June 2022.

7. **Gray codes for Fibonacci  $q$ -decreasing words**  
Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki  
*Theoretical Computer Science*, Available online 6 June 2022.
8. **Lattice paths with a first return decomposition constrained by the maximal height of a pattern**  
Jean-Luc Baril and Sergey Kirgizov  
*Discrete Mathematics Letters* Volume 8, 2022
9. **Pattern statistics in faro words and permutations**  
Jean-Luc Baril, Alexander Burstein and Sergey Kirgizov  
*Discrete Mathematics*, Volume 344, Issue 8, August 2021
10. **Bijections from Dyck and Motzkin meanders with catastrophes to pattern avoiding Dyck paths**  
Jean-Luc Baril and Sergey Kirgizov  
*Discrete Mathematics Letters* Volume 7, 2021
11. **Transformation à la Foata for special kinds of descents and excedances**  
Jean-Luc Baril and Sergey Kirgizov  
*Enumerative Combinatorics and Applications*, ECA 1:3 (2021) Article S2R19
12. **Pattern distributions in Dyck paths with a first return decomposition constrained by height**  
Jean-luc Baril, Richard Genestier and Sergey Kirgizov  
*Discrete Mathematics*, Volume 343, Issue 9, September 2020
13. **Bijections between directed animals, multisets and Grand-Dyck paths**  
Jean-luc Baril, David Bevan and Sergey Kirgizov  
*The Electronic Journal of Combinatorics*, Volume 27, Issue 2 (2020), Article P2.10
14. **Motzkin paths with a restricted first return decomposition**  
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian  
*INTEGERS* 19, September 2019
15. **Enumeration of Lukasiewicz paths modulo some patterns**  
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian  
*Discrete Mathematics*, Volume 342, Issue 4, April 2019
16. **Descent distribution on Catalan words avoiding a pattern of length at most three**  
Jean-luc Baril, Sergey Kirgizov and Vincent Vajnovszki  
*Discrete Mathematics*, Volume 341, Issue 9, September 2018, Pages 2608-2615
17. **Dyck paths with a first return decomposition constrained by height**  
June 2017, Jean-luc Baril, Sergey Kirgizov and Armen Petrossian  
*Discrete Mathematics*, Volume 341, Issue 6, June 2018, Pages 1620-1628
18. **Forests and pattern avoiding permutations modulo pure descents**  
Jean-luc Baril, Sergey Kirgizov and Armen Petrossian  
*Pure Mathematics and Applications (PUMA)*, Volume 27, Issue 1, 06 August 2018
19. **Patterns in treeshelves**  
Jean-luc Baril, Sergey Kirgizov and Vincent Vajnovszki  
*Discrete Mathematics*, Volume 340, Issue 12, December 2017, Pages 2946-2954
20. **The pure descent statistic on permutations**  
Jean-luc Baril, Sergey Kirgizov *Discrete Mathematics*, Volume 340, Issue 10, October 2017, Pages 2550-2558
21. **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
22. **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.

23. **Suppression Distance Computation for Set Covers and Hierarchies**

François Queyroi and Sergey Kirgizov

*Information Processing Letters* 115.9 (2015): 689-693, 2015

24. **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-relational : 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 (17)

1. **Sturm meets Fibonacci in Minkowski's fractal bar**

Sergey Dovgal and Sergey Kirgizov

Permutation Patterns 2023, Dijon, France, July 3-7, 2023

2. **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

3. **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

4. **An Architecture for Confidentiality Self-management in the Internet of Things**

Abdelhamid Garah, Nader Mbarek, Sergey Kirgizov

International Workshop on IoT Security and Quality of Service, SITIS 2022, October 21, 2022

5. **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

6. **Asymptotic bit frequency in Fibonacci words**

Sergey Kirgizov, Jean-Luc Baril and Vincent Vajnovszki

*GASCom 2022*, Villa Toeplitz, Varese, Italy, June 13-15, 2022

7. **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

8. **Qubonacci words**

- Jean-Luc Baril, Sergey Kirgizov and Vincent Vajnovszki  
*Permutations patterns 2021, Virtual*, University of Strathclyde, June 15-16
9. **Pattern distribution in faro words and permutations**  
 Jean-luc Baril and Sergey Kirgizov  
*Permutations patterns 2020, Virtual*, Valparaiso University, June 30 and July 1
  10. **Temporal density of community structure**  
 Sergey Kirgizov and Éric Leclercq  
*The 10th Conference on Network Modeling and Analysis : MARAMI*, Dijon, France, 2019
  11. **Pattern avoiding permutations modulo pure descents**  
 Jean-luc Baril, Sergey Kirgizov and Armen Petrossian  
*Permutation Patterns Conference*, Reykjavik University, Iceland, 2017
  12. **Temporal density of complex networks and ego-community dynamics**  
 Sergey Kirgizov, Eric Leclercq  
*Annual Conference on Complex Systems (ECCS or CCS)*, Amsterdam, 2016
  13. **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, 1-3 June 2016, *Grenoble, France*
  14. **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*
  15. **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*
  16. **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
  17. **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 (11)

1. **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
2. **Packing coloring and subsets preserving path distance**  
 Nicolas Gastineau, Benjamin Gras, Sergey Kirgizov, Mahmoud Omidvar  
*Journées Graphes et Algorithmes (JGA)*, Paris, 2016
3. **(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)
4. **Évaluation de l'influence dans un réseau multi-relational : 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

5. **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
6. **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
7. **Papers<sup>γ</sup>, Discussing board for scientific papers**  
*Conference SO Data 3, Paris, 26 Mars 2015*
8. **Internet Topology Dynamics: stochastic process estimation from partial observations**  
avec Clémence Magnien  
Journée jointe des GDR ISIS et Phénix "Analyse et inférence pour les réseaux", Paris, 2013
9. **Distribution multimodale de la taille du sous-graphe des plus courts chemins dans un graphe aléatoire**  
Journées Graphes et Algorithmes (JGA), Orsay, 2013
10. **Dynamique de la topologie de l'internet : impact de la fréquence de mesure sur les observations**  
24ème colloque GretsI, Brest, France, 2013
11. **Vers une modélisation réaliste de la dynamique de la topologie de routage au niveau IP**  
Journées Automnales 2012 ResCom, Paris, 2012

### Selected talks (7)

1. **Densité temporelle des réseaux complexes: détection et visualisation de l'évolution de la structure ego-communautaire**  
*Séminaire, Le Havre, 23 Mars 2017*
2. **Patterns in treeshelves**  
*Séminaire Le2i "Combinatoire, Réseaux et Sciences des Données", 14 Février, Dijon 2017*
3. **Densité temporelle des réseaux complexes et Évolution de la structure communautaire**  
*Séminaire de l'équipe ComplexNetworks team, Paris, 4 juillet, 2016*
4. **Graph-streaming pour l'étude de la dynamique des sphères médiatiques et politiques**  
*Réunion Projet CNRS PEPS MOMIS, Paris, 2015*
5. **Graph-streaming pour l'étude de la dynamique des sphères médiatiques et politiques**  
*Assemblée générale du Le2i, Dijon, 2015*
6. **Analyse empirique et modélisation de la dynamique de la topologie de l'Internet**  
*seminaire au LE2I, Dijon, 6 November 2014*
7. **Internet topology dynamics in ten minutes**  
*Masterclass-discussion with Vint Cerf, 2014*

### Communication skills

10 presentations at international conferences, 8 presentations at national french conferences, 6 other talks (including a presentation at General Assembly of Le2i research laboratory, the final presentation of a CNRS research project, and a masterclass-discussion with Vint Cerf), 3 poster presentations.

## Teaching activities (in french):

Subject		Amount of hours
<b>2020-2021, Université de Bourgogne, ESIREM, Dijon</b>		
Master 2 - Reinforcement learning	Lectures, Tutorials, Labs	12h
Master 2 - Big Data	Lectures, Tutorials, Labs	49h
Master 2 - Systèmes d'information avancés	Lectures, Tutorials, Labs	49h
Master 1 - Ingénierie des systèmes d'information	Lectures, Tutorials, Labs	35h
Geipi 1 - Unix-like systems	Lectures	21h
Licence 3 - Unix-like systems and C Languages	Lectures, Tutorials	14h
<b>2019-2020, Université de Bourgogne, ESIREM, Dijon</b>		
Master 2 - Big Data	Lectures, Tutorials, Labs	35h
Master 2 - Systèmes d'information avancés	Lectures, Tutorials, Labs	35h
Master 1 - Ingénierie des systèmes d'information	Lectures, Tutorials, Labs	35h
Geipi 1 - Unix-like systems	Lectures	21h
<b>2018-2019, Université de Bourgogne, ESIREM, Dijon</b>		
Master 2 - Systèmes d'information avancés	Lectures, Tutorials, Labs	35h
Geipi 1 - Unix-like systems	Lectures	21h
<b>2016-2017, Research and Teaching Fellow (ATER), Université de Bourgogne</b>		
Master 2 - Machine learning: reinforcement learning	Lectures, Tutorials, Labs	12h
Licence 2 - C/C++	Lab sessions	60h
	Tutorials	8h
Licence 2 - Operating Systems (network, threads, etc)	Lab sessions	40h
For Phd Students - OpenMP	Lectures, Tutorials, Labs	10h
For Phd Students - MPI	Lectures, Tutorials, Labs	10h
Licence 1 - Java, first steps	Tutorials	36h
	Lab sessions	72h
<b>2015-2016, Research and Teaching Fellow (ATER), Université de Bourgogne</b>		
Licence 1 - Java, first steps	Lectures	32h
	Lab sessions	80h
Licence 2 - Operating Systems (network, threads, etc)	Lab sessions	60h
Licence 2 - C et C++	Lab sessions	40h
Licence 1 - Advanced algorithms, OOP	Lab sessions	40h
<b>2015, postdoc, Université de Bourgogne</b>		
Licence 1 - Visual interfaces (Java)	Lab sessions	40h
<b>2012-2014, PhD Teaching fellow, Université Pierre et Marie Curie</b>		
Licence 2 - Compilation and virtual machines (Scheme, C)	Lab sessions	13.5h
Licence 1 - Recursive programming (Scheme)	Tutorial and lab sessions	84h
Licence 2 - Discrete Structures (logic, automata theory)	Lab sessions	10.5h
<b>Total</b>		≈ 1000 h

## Administrative responsibilities and other activities

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1. Project leader of "Artico — L'ART de la Combinatoire et ses Interactions", a scientific project (grant) supported by Bourgogne-Franche-Comté region, 2021-2023.
2. Popularization of science: participation in the ArtScience biennial "Réseaux ! Partout tu tisses" 2020-2021.
3. Supervision and organisation of various student projects and internships.
4. Principal participant of PEPS MoMIS SEISME project — "Graph-Streaming pour l'étude de la dynamique des sphères politiques et médiatiques".
5. Founder of Papers<sup>γ</sup> — discussing (and publishing) board for scientific papers.
6. Reviewer for The Electronic Journal of Combinatorics; Discrete Mathematics; SIAM Journal on Discrete Mathematics; The Australasian Journal of Combinatorics; Discrete Mathematics & Theoretical Computer Science; GASCom; ALGOTEL; IEEE Communications Letters; CompleNet; International Journal of Computer Mathematics; Journal of Automata, Languages and Combinatorics; Integers; Annales Mathematicae Silesianae; Filomat.
7. Member of the organisation committee of
  - (a) 21th International Conference on Permutation Patterns 2023;
  - (b) 16th International Conference on Signal Image Technology & Internet based Systems, SITIS 2022;
  - (c) 7th Workshop on Complex Networks, CompleNet 2016;
  - (d) ALGOTEL 2015 conference;
  - (e) MARAMI 2014 conference;
  - (f) Journée thématique "Dynamique des graphes" 2012;
  - (g) Journées Automnales 2012 ResCom à Paris 6.
8. Supervision of research trainee: L3 student of ENS Lyon.
9. Administration of ComplexNetworks team's website during my PhD.

## Hobbies

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Bicycle, Contemporain art