Curriculum vitæ

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Teaching address	IUT Ifs, Campus 3 Dep. informatique rue Anton Tchékhov 14123 Ifs

Athénaïs VAGINAY
born the 13th of December 1993
in Bagnolet, France

Professional Experience

Sep 2024 – ... Maîtresse de Conférences (Associate professor)
Université de Caen Normandie
Groupe de recherche en informatique, image et instrumentation de Caen (GREYC)

Apr 2024 – Aug 2024 Postdoctoral fellow
Université de Bordeaux
Laboratoire bordelais de recherche en informatique (LaBRI)

Jan 2023 – Mar 2023 Engineer
Centre national de recherche scientifique (CNRS)
Laboratoire lorrain de recherche en informatique et ses applications (Loria)

Sep 2022 – Dec 2022 Reseacher
Université de Lorraine
Laboratoire lorrain de recherche en informatique et ses applications (Loria)

Oct 2021 – Aug 2022 Temporary Lecturer and Researcher (ATER)
teaching 96h: Institut du Digital, Management, Cognition (IDMC)
research: Laboratoire lorrain de recherche en informatique et ses applications (Loria)

Oct 2018 – Sep 2021 PhD student (+ teaching in 2019)
Laboratoire lorrain de recherche en informatique et ses applications (Loria)
Centre de recherche en automatique de Nancy (Cran)

Dec 2017 – Jui 2018 Engineer
Université de Lille
Centre de recherche en informatique, signal et automatique de Lille (CRIStAL)

Education

2018-2023 PhD in Computer Science, Université de Lorraine
Laboratoire lorrain de recherche en informatique et ses applications (Loria)
Centre de recherche en automatique de Nancy (Cran)
"Synthesis of Boolean networks from the structure and dynamics of reaction networks"
Thesis defended the **7th of July 2023**

Advisor	Taha Boukhobza	Professor, Université de Lorraine
Co-advisor	Malika Smaïl-Tabbone	Maître de Conférences HDR, Université de Lorraine
President	Thierry Bastogne	Professor, Université de Lorraine
Reviewers	François Fages	Senior researcher, Inria Saclay
	Loïc Paulevé	CNRS Reseacher, Labri
Examinor	Anna Niarakis	Maître de Conférences HDR, Université d'Evry Val d'Essonne

2015–2017 Master Bioinformatique, Université Paris Diderot
Internship M2: Automatic annotation of smear blood image to diagnose malaria
Supervisor: Pierre Poulain, Institut Jaques Monod, Paris
Internship M1: Validation of a multi-task method guided by a graph to select features
Supervisor: Chloé-Agathe Azencott, École des Mines, Paris

2012–2015 Bachelor, biology major, Université Paris Diderot

2011–2012 One-year program for medicine, pharmacy, dentistry, and midwifery, Université Paris Diderot

Skills

Programming: Python, C, R, Java, web programming (HTML/CSS, framework flask)
Relational databases PostgreSQL
Combinatorial optimisation answer set programming (clingo), SAT (pySAT)
propositional logics, first-order logics, resolution and analysis of differential equations, statistics and machine learning (regression, decision tress, ...)
Other: git, continuous integratio, Docker, LaTeX

Co-supervision

2020, 3 months project Nicolas Thorr, M2 Applied Math Université de Lorraine

2021, 6 months internship Nolwenn Lebourdais, M2 Biostatistics Agrocampus Ouest (co-author of J1).

They worked on a project in collaboratino with biologistes from Cran. The project aims at better understing the impact of gene expression on the survival of patients with glioblastoma. The project primarily involved setting up a pipeline for differential gene expression analysis (high-dimensional transcriptomic data) across multiple conditions, as well as a machine learning pipeline for feature selection used in classification tasks and survival analysis.

2024, 3 months internship Maxime Zielinger, M1 Université de Bordeaux, co-supervised with Loïc Paulevé.
Calcul de trap spaces de réseaux booléens grâce à un encodage basé sur la forme DNF

Academic Service

Program comitee 2025 : ICLP

Review 2024 : CMSB conference ; 2023 : Computational and Biotechnology Journal (Elsevier).

Association of PhD student of Loria (2019-23) From 2019 to 2023, I was involved in several initiatives aimed at improving the quality of life for PhD students. In particular, I helped setting up a peer mentoring system (from sept 2020), organized informal weekend retreats for doctoral students (in 2019 and 2022), and helped coordinate monthly informal gatherings ("PhD coffee time") from 2019 to 2023.

French Association of Young Bioinformaticians – JeBiF (from 2014) Member of the association (since 2014), elected in the board (2016–2019), and secretary (2017–2019). This association aims to structure and increase the visibility of the community of young scientists in bioinformatics in France. We collaborate with other national organisations such as thematic research networks (GdR BIM, from CNRS) and the French Society for Bioinformatics (SFBI). I took part in organizing various scientific and informal events, including a workshop in 2019 in Nantes (held alongside the JOBIM conference), regular "JeBiF Pubs" in Paris (2016–2018), "open meetups" (2019–2021), and roundtable discussions for Master's students about careers and opportunities in bioinformatics (2018–2019). I was also involved in the design and facilitation of science outreach activities, which are detailed in the next section.

JOBIM Nancy (2021) I organised the local meetup (a dozen of participants, over 4 days), as part of the national open days in Biology, Computer Science, and Mathematics. (JOBIM2021).

Outreach

I helped setting up and animating scientific outreach activities, in various contexts.

Pint of Science, Nancy (2020) Member of the organisation committe + preparation of a talk with Hélène Dumond (co-author of [J2]. Because of the pandemics, everything was canceled.

A Scientist – A Classroom, Let's Do It! (2020) It is a program ran by Inria. A scientist is invited to speak for an hour with highschool classes, as part of their computer science course. I completed the training to prepare for the visit [1], but the visit itself was canceled because of the pandemic.

My thesis in 3 minutes (2021) The transcription of my presentation is available on my web site

Fêtes de la science (2017, 2018, 2020, via l'association JeBiF) Design and presentation of activities not directly related to my research, but they introduce general principles used in bioinformatics. Those activities have been used since 2017. I ran those activities in 2017 et 2018. In 2020, during the pandemics, I contributed to adapting those online : https://jebif.fr/apps/vulga/nounours/experts_accueil.php

[1] https://www.fondation-inria.fr/action_inria/chiche/

Scientific publication and communications

My research lies at the intersection of computer science and biology. I rely on **formal methods** (in particular, logical reasoning and constraint logic programming) to **synthesize models** of **biological processes**. My work focuses especially on the **automatic translation between different modeling formalisms**, with particular attention to preserve key properties during the transformation.
All of my publications (except for J1) are relevant to the field of computer science (applied to biology / computational biology), and are therefore indexed in DBLP.

Publications, on HAL : https://hal.science/search/index/q/*/authIdHal_s/nanis

Publications, on dblp : https://dblp.org/pid/299/8499.html (except [J1])

Oral communications, on my webpage nanis.fr

PhD thesis

A. Vaginay, "Synthesis of Boolean networks from the structure and dynamics of reaction networks", 2023, 191 pages. https://www.theses.fr/2023LORR0135

Peer-reviewed articles in journals

J2 **A. Vaginay**, T. Boukhobza, M. Smaïl-Tabbone "From quantitative SBML models to Boolean networks " *Applied Network Science*, Springer, Special Issue of the 10th International Conference on Complex Networks and their Applications, 2022, 23 pages. 10.1007/s41109-022-00505-8

J1 A. Hirtz, N. Lebourdais, F. Rech, Y. Bailly, **A. Vaginay**, M. Smaïl-Tabbone, H. Dubois-Pot-Schneider, H. Dumond "GPER Agonist G-1 Disrupts Tubulin Dynamics and Potentiates Temozolomide to Impair Glioblastoma Cell Proliferation " *Cells*, MDPI, 2021, 16 pages. 10.3390/cells10123438

Peer-reviewed articles in conferences

C5 S. Chevalie, D. Boyenval, G. Magaña-López, T. Roncalli, **A. Vaginay**, L. Paulevé "BoNesis: a Python-based declarative environment for the verification, reprogramming, and synthesis of Most Permissive Boolean networks." International conference on Computational Methods in Systems Biology (CMSB), 2024

C4 J. Niehren, C. Lhoussaine, **A. Vaginay** "Core SBML and Its Formal Semantics " *International conference on Computational Methods in Systems Biology (CMSB)*, Lecture Notes in Computer Science. Springer, 2023, pp. 124–143 10.1007/978-3-031-42697-1_9

C3 J. Niehren, **A. Vaginay**, C. Versari "Abstract Simulation of Reaction Networks via Boolean Networks " *International conference on Computational Methods in Systems Biology (CMSB)*, Lecture Notes in Computer Science. Springer, 2022, pp. 21–40. 10.1007/978-3-031-15034-0_2

C2 **A. Vaginay**, T. Boukhobza, M. Smaïl-Tabbone "From Quantitative SBML Models to Boolean Networks " *International Conference on Complex Networks and their Applications (CNA)*, Studies in Computational Intelligence. Springer, 2021, pp. 676-687. 10.1007/978-3-030-93413-2_56

C1 **A. Vaginay**, T. Boukhobza, M. Smaïl-Tabbone "Automatic Synthesis of Boolean Networks from Biological Knowledge and Data " *International Conference in Optimization and Learning (OLA)*, Communications in Computer and Information Science. Springer 2021, pp. 156-170. 10.1007/978-3-030-85672-4_12

Posters

P4 **A. Vaginay**, T. Boukhobza, M. Smail-Tabbone "SBML2BN: an Integrative Pipeline for the Synthesis of Boolean Networks from SBML Models " *International conference on Computational Methods in Systems Biology (CMSB)* 2021, Bordeaux, France

P3 **A. Vaginay**, M. Smail-Tabbone, T. Boukhobza "From Chemical Reaction Networks to Boolean Networks " *Journées Nationales du GDR IM (JNIM)* 2022, Lille, France

P2 **A. Vaginay**, M. Smail-Tabbone, T. Boukhobza "Towards an automatic conversion from SBML core to SBML qual " *Journées Ouvertes en Biologie, Informatique et Mathématiques (JOBIM)* 2019, Nantes, France

P1 **A. Vaginay**, M. Smail-Tabbone, T. Boukhobza "Towards an automatic conversion from SBML core to SBML qual " *École thématique Modélisation Formelle de Réseaux de Régulation Biologique (bioregul)* 2019, Porquerolles, France

Oral communications

The slides are available on my personal webpage. In addition to the list below, I gave seven presentations at the seminar of the CAPSID team at Loria, where I completed my PhD. These were principally practice talks for upcoming conferences or progress reports on my research work.

O14 "A Touristic Guide on the Updates of Boolean Networks " (seminar) *Séminaire Algorithmique, GREYC, Caen* 10 Dec 2024, Caen, France
https://www.greyc.fr/event/seminaire-algorithmique-un-panorama-des-modes-de-mises-a-jour-des-reseaux-dautomates-booleens-athenais-vaginay-greyc/

O14 "Synthesis and simulation of formal models of biological systems " (seminar) *Sémidoc, LaBRI* 19 Jui 2024, Bordeaux, France
https://afodib.labri.fr/semidoc

O13 "Constraint-based abstraction of reaction networks to Boolean networks " (seminar) *Computational Logic Center, Université de Iowa* 26 Feb 2024, Iowa City, État-Unis
https://cs.uiowa.edu/event/137841/0

O12 "Constraint-based abstraction of reaction networks to Boolean networks " (seminar) *équipe CODAG, GREYC* 5 Dec 2023, Caen, France
https://indico.mathrice.fr/event/532/

O11 "From reaction networks to Boolean networks: why and how " (seminar) *équipe CANA, LIS* 14 Nov 2023, Marseille, France
https://cana.lis-lab.fr/#seminars-link

O10 "Synthesis of Boolean Networks from the Structure and Dynamics of Reaction Networks " (invited presentation) *Thematic workshop on networks and biological models inference* 3 Jui 2023, Marseille, France
https://www.bioss-cnrs.fr/events/cirm2023/

O9 "Sélection et analyse de modèles pour les réseaux biologiques " (invited presentation) *Séminaire de la Fédération Charles Hermitte (FCH)* 13 Dec 2022, Nancy, France

O8 "ASKeD-BN: Automatic Synthesis of Boolean Networks from Knowledge and Data " (paper highlight) *Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP@FLoC)* 31 Jui 2022, Haifa, Israël
https://easychair.org/smart-program/FLoC2022/

O7 "From Chemical Reaction Networks to Boolean Networks, Automatically " (invited presentation) *séminaire virtuel du GT Bioss* 3 Dec 2021, en ligne
https://www.bioss-cnrs.fr/seminaires/2021-12/

O6 "Automatic synthesis of boolean networks from biological knowledge and data " (paper presentation) *International Conference on Complex Networks and their Applications (CNA)* 1er Dec 2021, Madrid, Espagne
https://easychair.org/smart-program/COMPLEXNETWORKS2021/

O5 "Modelling Biological Systems with Boolean Networks " (invited presentation) *Journées scientifiques de la Fédération Charles Hermite "Science des Réseaux "* 18 Nov 2021, Nancy, France
https://www.fr-hermite.univ-lorraine.fr/Documents/Journees%20scientifiques/Archives%202021/Journees%20FCH%20Reseaux_Complet.pdf

O4 "SBML2BN: an Integrative Pipeline for the Synthesis of Boolean Networks from SBML Models " (flash poster presentation) *International conference on Computational Methods in Systems Biology (CMSB)* 23 Sep 2021, Bordeaux, France
https://cmsb2021.labri.fr/program/index.html

O3 "ASKeD-BN: Automatic Synthesis of Boolean Networks from Knowledge and Data " (paper highlight) *Journées Ouvertes en Biologie, Informatique et Mathématiques (JOBIM)* 7 Jui 2021, en ligne
https://jobim2021.sciencesconf.org/program

O2 "ASKeD-BN: Automatic Synthesis of Boolean Networks from Knowledge and Data " (paper presentation) *International Conference in Optimization and Learning (OLA)* 23 Jun 2021, en ligne
https://ola2021.sciencesconf.org/data/pages/Program_OLA_2027.htm

O1 "Towards an automatic conversion from SBML core to SBML qual " (flash poster presentation) *Workshop des Jeunes Bioinformaticiens de France (JeBiF)* 30 Jui 2019, Nantes, France
https://jebif.fr/evenements/jebif-workshop/2019-nantes/

Teaching

Since septembre 2024, I am a "maîtresse de conférence" (assistant professor) in the université of Caen. I teach 192 HETD[2] The following table summarized the hours I gave **before becoming an assistant professors**: 96 HETD as my part-time teaching assistant role at the university of Lorraine, 36 HETD as a PhD students, and a few more hours before that.

Year	Name	Public	CM[3]	TD[4]	TP[5]	Total
2021–2022 demi ATER	Algorithmique et structure de données	L1 MIASH		15		15
	Programmation C (Semestre 1)	L1 MIASH			20	20
	Programmation C (Semestre 2)	L1 MIASH			26	26
	Programmation Python	M1 SC, SDL, TAL			10,5	10,5
	Traitement automatique des langues	L2 MIASH		10		10
	Méthodologie, LaTeX et gestion de bibliographie	M2 TAL et SC	2		1,75	3,75
	Méthodologie, LaTeX et gestion de bibliographie	M1 TAL et SC	1		1	2
						87,25
2019 DCCE	Bureautique et recherche documentaire	1A DUT GBS,			16	16
	Bureautique	1A DUT GB2A			32	32
						48
2017 Vacataire	Bureautique, vie numérique et recherche documentaire	L1 EA			12	**12**
2014–2015 Tutrice	Bureautique, vie numérique et recherche documentaire	L1 toutes disciplines			67	**67**
TOTAL 214,25h = 3h CM + 25h TD + 186,25h TP						

EA Études anglophones ; **GBS** Génie Biologique – Santé ; **GB2A** Génie Biologique – Agro-Alimentaire ; **MIASHS** Mathématiques et Informatique Appliquées aux Sciences Humaines et Sociales ; **SC** Sciences Cognitives ; **SDL** Science du Langage ; **TAL** Traitement Automatique du Langage

[2]Hour Equivalent Tutorial, a French teaching unit used to standardize workload across different types of teaching activities. 1 HETD equals 1 hour of tutorial, while 1 hour of lecture counts for 1.5 HETD. Labs are weighted differently depending on sevaral factors.