

# Valentin Roussel | PhD student

Institut national supérieur du professorat et de l'éducation – Lyon – France

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Member of the Association for Research in Mathematical Education (ARDM)

I am a PhD student at the S2HEP laboratory, in Lyon, and I work under the direction of Jana TRGALOVA. My work covers three areas of research : educational sciences, mathematics and computer science. My main research interests are in mathematical modeling, information and communication technologies for education (ICT,) teacher education, and critical thinking.

## Research interests

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- **Educational sciences**
  - The notion of model in mathematics : teacher education and epistemology of the notion.
  - Critical thinking in mathematics class
  - Philosophy of education
- **Computer science and ICT**
  - Algorithms
  - Cellular automata
- **Mathematics**
  - Bayesian statistics and inference
  - Dynamic systems

## Education

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### Academic qualifications.....

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|---|---------------------|
| ○ <b>University of Lyon</b>   | <b>Lyon, France</b> |
| ○ <i>Ph.D, Applied Mathematics and Mathematical Applications</i>    | <i>since 2019</i>   |
| ○ <b>École Normale Supérieure de Lyon</b>                           | <b>Lyon, France</b> |
| ○ <i>Master, Didactics and epistemology of sciences</i>             | <i>2017–2019</i>    |
| ○ <b>University of Lyon</b>   | <b>Lyon, France</b> |
| ○ <i>Licence/Bachelor, Computer Science and Applied Mathematics</i> | <i>2015–2017</i>    |

### Academic certifications.....

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|---|----------------------------|
| ○ <b>Johann Wolfgang Goethe university</b>  | <b>Frankfurt, Germany</b>  |
| ○ <i>Academic exchange, MoMaTrE– Mobile math Trails in Europe Intensive program</i>       | <i>2019 (2 weeks)</i>      |
| ○ <b>Université de Lyon</b>   | <b>Lyon, France</b>        |
| ○ <i>Certifying trainings, Computer and internet certificates Level 1 and 2 (Teacher)</i> | <i>2018 (2 × 3 months)</i> |
| ○ <b>Lyon-Est Faculty of Medicine</b>   | <b>Lyon, France</b>        |
| ○ <i>Certificate, Level 1 civic prevention and relief</i>                                 | <i>2018 (2 days)</i>       |

## Additional professional trainings.....

- **Institut Français de l'Éducation** **Lyon, France**  
*Facilitate collaborative work between education and research actors* 2019 (3 days)  
*Support teachers in priority education* 2019 (3 days)  
*Mathematics problems for seeking, experimenting and manipulating* 2018 (2 days)  
*Personalization of learning in a digital environment* 2018 (4 days)
- **École Polytechnique** **Paris, France**  
*How to write and publish a scientific article* 2018 (1 week)
- **Université de Lyon** **Lyon, France**  
*Scientific integrity in research professions* 2020 (2 days)  
*Research ethics* 2020 (3 days)  
*Training to teach in higher education* 2020 (5 days)  
*Introduction to statistics with R* 2020 (4 days)  
*Reproducible research: methodological principles for transparent science* 2020 (6 days)  
*Team management* 2020 (3 days)

## Professional experience

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### Research.....

- **Sciences, Société, Historicité, Éducation et Pratiques (S2HEP) laboratory** **Lyon**  
*Contractual Ph.D student* since 2019  
 Young researcher, my work focuses on teacher education, science mediation and educational sciences.
- **Sciences, Société, Historicité, Éducation et Pratiques (S2HEP) laboratory** **Lyon**  
*Introductory internship* 2019 (6 months)  
 Internship in research groups, introduction to research methodologies, information monitoring, support for the production and production of the Master 2 thesis.
- **University Johann Wolfgang Goethe of Frankfurt** **Frankfurt**  
*Intensive study program* 2019 (2 weeks)  
 Development of didactic engineering for the MathCityMap european project, cycle of conferences around the teaching and didactics of mathematics, supervision of "Mathematical Rallies".

### Education science et computer science.....

- **Institut national supérieur du professorat et de l'éducation** **Lyon**  
*Educational engineer, trainer* since 2019  
 Teacher trainer – Algorithmics, mathematics, didactics
- **Institut Français de l'éducation – Department of digital mediation of knowledge** **Lyon**  
*Educational engineer CDD* 2019 (4 months)  
 Integration in the European Horizon 2020 NEXT-LAB research project, development of ILS (Inquiry Learning Spaces), contribution to educational productions and publications, teacher training in the use of ILS.
- **Maison des Mathématiques et de l'Informatique** **Lyon**  
*Educational engineer* 2018 (3 months)  
 Teacher, facilitator - Organization and animation of mathematical extension workshops for primary classes, sensitization workshops for mathematics programs for parents.

- **Orange** **Lyon**  
*Web developer CDD* *2017 (3 months)*  
 Intranet and web application design for the Ericsson Support team

### Seasonal employment cumulated.....

- **S.A CTR-LG** **Bourg-en-bresse**  
*Maintenance and handling technician CDDs* *2014–2016 (9 months)*

## Computer skills

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- **Web** : PHP, CSS, HTML, relational algebra
- **Frameworks** : Bootstrap (advanced), LaTeX (advanced), Zotero, MySQL, R (advanced), Eclipse, Jupyter, Github
- **Programming languages** : Python, C, C++

## Languages

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- English : C1 (Fluency, autonomy, 6 months of experience abroad)
- Espagnol : A2 (Elementary)

## Resources and scientific activities

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### In progress (research projects and academic resource projects).....

- **Roussel,V. (in progress), La modélisation en mathématique dans la formation des enseignants. Approche TICE, démarche d'investigation, contraintes institutionnelles et évolutions curriculaires internationales : quels besoins pour les enseignants ?** Thesis supervised by Jana TRGALOVA ; researches supported by the French Institute of Education in Lyon and the National Institute of Higher Education and Teaching.

### Master theses.....

- **Roussel,V. (2019), Esprit critique, mathématiques & éducation : ressources didactiques et pédagogiques pour une intégration de l'esprit critique en classe de mathématiques - une étude au troisième cycle.** Master thesis (M2) supervised by Jana TRGALOVA ; researches supported by the French Institute of Education in Lyon.
- **Roussel,V. (2018), TICE & logiciels de géométrie dynamique : pratiques et invariants didactiques des situations d'apprentissage.** Master thesis (M1) supervised by Jana TRGALOVA; regional survey supported by Christian MERCAT, director of IREM Lyon.

### Publications.....

- (Forthcoming) **ROUSSEL, V (2019)**, Critical thinking in mathematics class in cycle 3. Proceedings of the 2019 National Seminar on Mathematics Didactics. Keywords: Epistemology, critical thinking, cognitive psychology, didactics, mathematics.

### Seminars.....

- **"Collectif mathématiques" of the Lyon Academy** **INSPE de Lyon**  
*Invited as young researcher (with a communication)* *November 2019*  
 Annual regional seminar organized by the Higher National Institute for Teaching and Education. This event aims to exhibit main research works in progress in the Lyon Academy. At the request of Mathias Front, co-pilot "Collectif mathématiques", I present that day my research work during an intervention entitled "Exercising critical thinking in mathematics class: an engineering proposal, didactic perspectives".

- **The didactical challenge of dynamic geometry environments**  
*Invited as young researcher (with a communication)*

Seminar organized by Luc TROUCHE around environments of dynamic geometry : resources, choice of teachers and knowledge at stake. During this seminar, I lead an intervention on the theme "Dynamic geometry, critical thinking and modeling: convergence of results and perspectives of thesis".

**Institut français de l'éducation**  
November 2019
- **Creuset d'Analyse des recherches collaboratives**  
*External contributor*

The Collaborative Research Analysis Crucible (CRaC) is a seminar to better understand the processes at work in research conducted in collaboration with educational actors. I step in this seminar, proposing an external analysis on a corpus on the theme: "Passers, mediators, brokers: what roles, what actions to facilitate the contribution of each to the production of knowledge in collaborative research?".

**Institut français de l'éducation**  
2019-2020 (4 sessions)
- **Thinking and transforming spaces in the digital age**  
*Invited as young researcher*

Seminar organized by the DANE of Lyon in partnership with ENS Lyon, Ifé, the Canopé network, the University of Cergy Pontoise and La Martinière Duchère.

**Lycée la Martinière Duchère**  
October 2019
- **Digital technology at the service of educational differentiation**  
*Trainer, lecturer*

How can trainers support teachers in using a digital platform to design personalized learning content and integrate it into their daily teaching? During this hackathon, I step in as a trainer and give a talk on "Differentiation: From a Knowledge-Based Education to a Student-Centered Education?". I propose in particular a historical and sociocultural analysis of the French educational currents.

**Institut français de l'éducation**  
June 2019
- **Creuset d'Analyse des recherches collaboratives**  
*Observer*

The Collaborative Research Analysis Crucible (CRaC) is a seminar to better understand the processes at work in research conducted in collaboration with educational actors.

**Institut français de l'éducation**  
2018-2019 (4 sessions)

## Conferences.....

- **Le climat change...alors ?**  
*Event organizer*

In partnership with the Association for Science and Transmission of the Critical Mind (ASTEC), the French Institute of Education organized a conference-debate with Thomas DURAND, scientific mediator of the YouTube channel "La Tronche en Biais "and Scientific Director of ASTEC ; Marie DEGREMONT, expert political scientist ; Samuel MORIN, climate expert and contributor to the IPCC report ; and Lionel SCOTTO D'APOLLONIA, socio-epistemologist expert.

**Institut français de l'éducation**  
June 2019

## Congresses.....

- **Rencontres Jeunes Chercheurs en EIAH**  
*Invited as young researcher*

Organized every two years, this French-speaking conference sponsored by ATIEF (Association of Information Technologies for Education and Training) aims to promote research and the training of student researchers.

**Poitiers**  
June 2020
- **CFEM-ARDM national seminar**  
*Invited as young researcher (with a communication)*

Seminar on mathematics didactics of the ARDM and CFEM-ARDM symposium on november 21 and 22 in Paris. I proposed a communication around a poster on the theme "Critical thinking in mathematics class".

**Paris**  
November 2019

## Educational and digital resources.....

- **ROUSSEL, V (2019)** Introduction à l'inférence bayésienne - Cours 1 : Axiomatisation. Master. France. 2019. **hal-02315970** : une exploration mathématique et épistémologique du concept et des principaux mécanismes à l'oeuvre dans la pensée bayésienne. Mots-clefs : Méthodes et statistiques, épistémologie, éducation.
- **ROUSSEL, V (2019)**, Introduction à l'inférence bayésienne - Cours 2 : le théorème de Bayes. Master. France. 2019. **hal-02315971** : une exploration mathématique et épistémologique du concept et des principaux mécanismes à l'oeuvre dans la pensée bayésienne. Mots-clefs : Méthodes et statistiques, épistémologie, éducation.
- **ROUSSEL, V (2019)**, Introduction à l'inférence bayésienne - Cours 3 : le problème de Monty Hall. Master. France. 2019. **hal-02500147** : une exploration mathématique et épistémologique du concept et des principaux mécanismes à l'oeuvre dans la pensée bayésienne. Mots-clefs : Méthodes et statistiques, épistémologie, éducation.