

Pierre Vandenhove

PhD Student in Mathematics and
Computer Science

Bâtiment De Vinci, Avenue Victor Maistriau 15
7000 Mons, Belgium
☎ +3265373515
✉ pierre.vandenhove@umons.ac.be
📄 math.umons.ac.be/staff/Vandenhove.Pierre/
🌐 [pvdhove](#)

Last updated on July 1, 2022.

Research Experience

- Oct 2019–
Now **PhD thesis**, *UMONS – Université de Mons, Belgium; Université Paris-Saclay, CNRS, ENS Paris-Saclay, Laboratoire Méthodes Formelles (LMF), France.*
Title: *Frontiers of Many-sided Reactive Synthesis.*
Supervisors: [Mickael Randour](#) (UMONS) and [Patricia Bouyer](#) (LMF).
[F.R.S.-FNRS](#) Research Fellow (expected duration: four years).
- Jan–
Jun 2019 **Master’s thesis**, *UMONS, Belgium.*
Title: *Reachability in Stochastic Hybrid Systems.*
Supervisors: Thomas Brihaye and Mickael Randour. Grade: 20/20.
- Aug–
Nov 2018 **Student intern**, *OCaml Labs, University of Cambridge, UK.*
Implementation of the Mask R-CNN architecture for image segmentation and classification using OCaml’s numerical library Owl. Contributions to the *computation graph* module.
- Jul 2017 **Research intern**, *Algorithms Lab, UMONS, Belgium.*
Received a grant for a research internship in graph theory about coloration problems.

Education

- 2017–2019 **Master’s degree in Mathematics and Computer Science**, *UMONS, Belgium, Summa cum laude.*
Exchange year at *Durham University, UK* in 2017–2018. Passed with first-class honors.
Average grade: 19.6/20, Award of the Mathematical Department.
- 2014–2017 **Bachelor’s degree in Mathematics**, *UMONS, Belgium, Summa cum laude.*
Academic minor in Computer Science.
Average grade: 19.1/20, Award of the Mathematical Department.

Publications

Extended versions are available on arXiv (links on [my website](#)).

Peer-reviewed journals

[BBR+22] **Decisiveness of Stochastic Systems and its Application to Hybrid Models.** Patricia Bouyer, Thomas Brihaye, Mickael Randour, Cédric Rivière, Pierre Vandenhove. Accepted to *Information and Computation*, Elsevier, 2022.

[BLO+21] **Games Where You Can Play Optimally with Arena-Independent Finite Memory.** Patricia Bouyer, Stéphane Le Roux, Youssouf Oualhadj, Mickael Randour, Pierre Vandenhove. *Logical Methods in Computer Science*, volume 18, issue 1, pages 11:1–11:44, 2022.

Peer-reviewed conference proceedings

[BCRV22] **Half-Positional Objectives Recognized by Deterministic Büchi Automata**. Patricia Bouyer, Antonio Casares, Mickael Randour, Pierre Vandenhove. *Accepted to the 33rd International Conference on Concurrency Theory (CONCUR 2022)*, LIPIcs 243, Schloss Dagstuhl, pages 1–18, 2022.

[BRV22] **Characterizing Omega-Regularity through Finite-Memory Determinacy of Games on Infinite Graphs**. Patricia Bouyer, Mickael Randour, Pierre Vandenhove. *39th International Symposium on Theoretical Aspects of Computer Science (STACS 2022)*, LIPIcs 219, Schloss Dagstuhl, pages 16:1–16:16, 2022.

[BORV21] **Arena-Independent Finite-Memory Determinacy in Stochastic Games**. Patricia Bouyer, Youssef Oualhadj, Mickael Randour, Pierre Vandenhove. *32nd International Conference on Concurrency Theory (CONCUR 2021)*, LIPIcs 203, Schloss Dagstuhl, pages 26:1–26:18, 2021.

[BBR+20] **Decisiveness of Stochastic Systems and its Application to Hybrid Models**. Patricia Bouyer, Thomas Brihaye, Mickael Randour, Cédric Rivière, Pierre Vandenhove. *Eleventh International Symposium on Games, Automata, Logics, and Formal Verification (GandALF 2020)*, EPTCS 326, pages 149–165, 2020.

[BLO+20] **Games Where You Can Play Optimally with Arena-Independent Finite Memory**. Patricia Bouyer, Stéphane Le Roux, Youssef Oualhadj, Mickael Randour, Pierre Vandenhove. *31st International Conference on Concurrency Theory (CONCUR 2020)*, LIPIcs 171, Schloss Dagstuhl, pages 24:1–24:22, 2020. *Nominated (among 4 papers) for the Best Paper Award of CONCUR 2020.*

Talks

You can find the corresponding slides, posters and sometimes videos on [my website](#).

- 2022 – Half-Positional Objectives Recognized by Deterministic Büchi Automata, *Highlights 2022 of Logic, Games and Automata*, 29/06, Paris, France.
- Existence of memoryless optimal strategies through universal graphs [based on a LICS'22 paper], *UMONS Formal Methods Reading Group*, 02/06, Mons, Belgique.
- Jeux pour l'informatique et complexité des stratégies, *Séminaire Jeunes de l'UMONS*, 21/04, Mons, Belgium.
- Characterizing Omega-Regularity Through Finite-Memory Determinacy of Games on Infinite Graphs, *Current Trends in Graph and Stochastic Games (GAMENET Workshop)*, 06/04, Maastricht, The Netherlands.
- Characterizing Omega-Regularity Through Finite-Memory Determinacy of Games on Infinite Graphs, *STACS 2022: 39th International Symposium on Theoretical Aspects of Computer Science*, 17/03, Online.
- Characterizing Omega-Regularity Through Finite-Memory Determinacy of Games on Infinite Graphs, *LaBRI seminar*, 03/03, Bordeaux, France.

- 2021 – Characterizing Omega-Regularity Through Strategy Complexity of Games on Infinite Graphs [Ongoing Work], *UMONS Formal Methods Reading Group*, 23/09, Mons, Belgique.
- Characterizing Omega-Regularity Through Finite-Memory Determinacy of Games on Infinite Graphs, *Journées du GT Vérif*, 17/11, ENS Paris-Saclay, Gif-sur-Yvette, France.
- Arena-Independent Finite-Memory Determinacy, *Highlights 2021 of Logic, Games and Automata*, 15/09, Online.
- Arena-Independent Finite-Memory Determinacy in Stochastic Games, *CONCUR 2021: The 32nd International Conference on Concurrency Theory*, 26/08, Online.
- Arena-Independent Finite-Memory Strategies, *GT ALGA - Journées annuelles 2021*, 17/06, Online.
- Arena-Independent Finite-Memory Strategies, *GT Model-Checking and Synthesis, LMF, Université Paris-Saclay*, 23/04, Online.

- 2020 – Understanding Finite-Memory Determinacy, *LMF Research Days*, 09/12, Online.
- Decisiveness of Stochastic Systems and its Application to Hybrid Models, *Eleventh International Symposium on Games, Automata, Logics, and Formal Verification (GandALF 2020)*, 22/09, Online.
- Games Where You Can Play Optimally with Arena-Independent Finite Memory, *CONCUR 2020: The 31st International Conference on Concurrency Theory*, 02/09, Online.
- Games Where You Can Play Optimally with Arena-Independent Finite Memory, *MOVEP 2020: 14th Summer School on Modelling and Verification of Parallel Processes*, 22/06, Online.

- 2019 – Reachability in Stochastic Hybrid Systems, *Highlights 2019 of Logic, Games and Automata*, 19/09, Warsaw, Poland.
- Reachability in Stochastic Hybrid Systems, *13th International Conference on Reachability Problems (RP'19)*, 12/09, Brussels, Belgium.
- Reachability in Infinite Markov Chains, *Mardi des Chercheurs 2019*, 05/03, Université de Mons, Mons, Belgium.

Teaching

- Sept 2019– **Formal Methods for System Design**, *Teaching Assistant*, UMONS.
- Now Teaching assistant for the course given by Mickael Randour. Fourth year students.
- Aug 2021 *Mentoring*, UMONS.
- Mentorship of Luca Lani (student intern, UMONS) on strategy complexity of zero-sum games.
- Aug 2015, *Student tutor*, UMONS.
- 2016, 2017 Gave math and computer science lessons to university students retaking an exam.

Languages

French (native), English (full working proficiency), Dutch (elementary proficiency).

Attended research events

- 2022
 - *Highlights 2022 of Logic, Games and Automata*, Paris, France.
 - *Current Trends in Graph and Stochastic Games (GAMENET Workshop)*, Maastricht, The Netherlands.
 - *39th International Symposium on Theoretical Aspects of Computer Science (STACS 2022)*, Online.
- 2021
 - *Journées du GT Vérif*, ENS Paris-Saclay, Gif-sur-Yvette, France.
 - *Highlights 2021 of Logic, Games and Automata*, Online.
 - *CONCUR 2021: The 32nd International Conference on Concurrency Theory*, Online.
 - *GT ALGA - Journées annuelles 2021*, Online.
- 2020
 - *Spotlight on Games*, Online.
 - *GandALF 2020: Eleventh International Symposium on Games, Automata, Logics, and Formal Verification*, Online.
 - *Highlights 2020 of Logic, Games and Automata*, Online.
 - *CONCUR 2020: The 31st International Conference on Concurrency Theory*, Online.
 - *MOVEP 2020: 14th Summer School on Modelling and Verification of Parallel Processes*, Online.
- 2019
 - *Highlights 2019 of Logic, Games and Automata*, Warsaw, Poland.
 - *13th International Conference on Reachability Problems (RP'19)*, Brussels, Belgium.
 - *Theory and Algorithms in Graph and Stochastic Games*, Université de Mons, Mons, Belgium.
 - *Mardi des Chercheurs*, Université de Mons, Mons, Belgium.
- 2018
 - *FoPSS Logic and Learning School*, University of Oxford, Oxford, UK.
 - *MOVEP 2018*, ENS Paris-Saclay, Cachan, France.
 - *International Conference on Functional Programming (ICFP'18)*, St. Louis, Missouri, United States.
- 2017
 - *Computers in Scientific Discoveries 8*, Université de Mons, Mons, Belgium.

Programming skills

Languages OCaml, Python, Java, C++, Prolog, \LaTeX

Miscellaneous

Reviewing I have written reviews for GandALF'20, LICS'21, CONCUR'21, FORMATS'21, SETTA'21, ATVA'22.

ICPC Participation in ICPC (students' programming contests) from 2016 to 2018. Our team CPUMONS won a bronze medal (rank 12/114) during NWERC 2016, 3rd place during BAPC 2016 and 2018, 5th place during BAPC 2017. Team's coach in 2019, 2020, 2021.

Driving License B