CURRICULUM VITAE - Xuande Chen, P. Eng., Ph. D.

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Rimouski, Québec, G5L 4H8, Canada

PROFIL

I'm an assistant professor in the Department of Mathematics, Computer Science and Engineering at the Université du Québec à Rimouski. My research focuses on three main areas: 1) durability of innovative civil engineering structures and materials, 2) monitoring of infrastructures exposed to extreme climatic conditions, and 3) sustainable management of road and coastal networks. Currently, my team is focusing on understanding concrete degradation in aging coastal infrastructures, particularly those exposed to seawater and harsh microclimate, through advanced monitoring and modeling approaches.

EDUCATION

- **Laval University** *09. 2017 - 01. 2022*
  PhD in civil engineering Quebec, Canada
  - Advisor: Prof. David Conciatori
  - Grades: 4.33/4.33
  - PhD thesis: Numerical modeling and experimental study of coupled hygro-thermo-chemo-electric transport behavior of cementitious materials
- **Northwestern University** *08. 2018 - 03. 2019*
  PhD in civil engineering (joint-program) Evanston, USA
  - Advisor: Prof. Gianluca Cusatis
  - Project: Discrete lattice modeling of concrete corrosion under the effect of hydro-thermal coupling
- **École Normale Supérieure Paris-Saclay (Université Paris-Saclay)** *09. 2016 - 07. 2017*
  Master of research, Materials and Structures Paris, France
  - First rank on graduation
- **École spéciale des travaux publics, du bâtiment et de l'industrie** *09. 2014 - 07. 2016*
  Master (Engineering Diploma), Roads and engineering structures Paris, France
- **Wuhan University** *09. 2010 - 07. 2014*
  Bachelor's degree in Civil Engineering, with double degree in French Wuhan, China
  - TOP 10 university in China, ranked 108th worldwide

PROFESSIONAL EXPERIENCE

- **Univesité du Québec à Rimouski** *09. 2022 - now*
  Assistant Professor Rimouski, Canada
  - Research: Concrete durability, Chloride sensor, Non-destructive infrastructure monitoring, Multiphysics, Fluid mechanics
  - Teaching: Advanced numerical methods in civil engineering, Design of concrete structures, Design of steel structures, Final year project, Structural analysis, Mechanics of materials
- **Laval University** *01. 2022 - 08. 2022*
  Postdoctoral fellow Quebec, Canada
  - Research: Development of the TransChlor2D multiphysics model, Assessment of bridge service life
- **Laval University** *09. 2017 - 12. 2021*
  Research assistant Quebec, Canada
  - Research: Finite elements and discrete modeling, Transport in porous materials, Multiphysics coupling in concrete
- **Laval University** *09. 2017 - 09. 2021*
  Teaching assistant Quebec, Canada
  - Teaching: Concrete structures, Structural analysis
- **Laboratoire de Mécanique Paris-Saclay, CNRS** *01. 2017 - 07. 2017*
  Research assistant Paris, France
  - Research: Modeling the damping effect of a reinforced concrete beam
- **VINCI Construction** *03. 2016 - 09. 2016*
  Site supervisor Paris, France

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, S=SUBMISSION, T=THESIS

[C.1] Xuande Chen, et al. (2024). **Measuring Chloride-Induced Structure Corrosion in Marine Environment: A Characterization Study of Fluorescence-Based Optical Sensor**. In *The 6th International Conference on Advances in Civil and Ecological Engineering Research*, pp. 197-208. Lecture Notes in Civil Engineering. July 2024, Beijing, China.

[C.2] Xuande Chen, et al. (2023). **UHPFRC Permeability to Chloride under Service Load**. In *4th ACIfib-RILEM Workshop on Fibre Reinforced Concrete: From Design to Structural Applications*. FRC 2023. September 2023, Tempe, United States.

[C.3] Xuande Chen, et al. (2023). **Numerical modeling of water transport in Ultra-High-Performance Fiber-Reinforced Concrete**. In *Numerical Modeling Strategies for Sustainable Concrete Structures. Workshop in Strategies for Sustainable Concrete Structures*. Numerical Modeling Strategies for Sustainable Concrete Structures. July 2023, Marseille, France.

[C.4] Xuande Chen, et al. (2022). **An Experimental Study on the Sorption in UHPFRC: Adaptation of the DVS Measurement Procedure**. In *Proceedings of the 1st Conference of the European Association on Quality Control of Bridges and Stru*. 1st Conference of the European Association on Quality Control of Bridges and Structures – EUROSTRUCT2021. July 2021, Padova, Italy.

[C.5] Xuande Chen, et al. (2021). **Effect of the temperature on the water transport by capillarity into the concrete porosity**. In *4th International RILEM conference on Microstructure Related Durability of Cementitious Composites*. TU Delft. May 2021, Hague, Netherlands.

[S.1] Xuande Chen, et al. (2025). **Characterization and modeling of the moisture diffusion in ultra-high-performance fiber-reinforced concrete considering the sorption isotherm and hysteretic behaviors**. Manuscript submitted for publication in *Cement and Concrete Composites*.

[S.2] Jinxing Li, Xuande Chen, Alice Wang, et al. (2025). **Wood fiber reinforced oxidized starch-based composite foam: An environmentally friendly, flame retardant and hydrophobicinsulation material**. Manuscript submitted for publication in *Journal of Cleaner Production*.

[T.1] Xuande Chen (2022). **Modélisation numérique et étude expérimentale des comportements couplés de transport hygro-thermochimio-électrique des matériaux cimentaires**. Thèse de doctorat, *Université Laval*, Janvier 2022.

[J.1] Abdoul Salam Bah, Xuande Chen, et al. (2025). Bridge Service Life and Impact of Maintenance Events on the Structural State Index. *Case studies in civil engineering*, Vol. 22, ISSN 2214-5095.

[J.2] Samaneh Khani, Xuande Chen, et al. (2024). **Chloride Ingress in De-Icing Salt-Exposed Bridge: Numerical Modeling and Field Investigations**. *SSRN*, Preprint.

[J.3] Xuande Chen, et al. (2023). **Numerical Modeling of Multi-Ionic Transport With/Without Electrical Field Applied in Sound and Microcracked Ordinary and Ultra-High-Performance Fiber-Reinforced Concrete**. *Archives of Civil and Mechanical Engineering*, Vol. 23, Issue 232.

[J.4] Vicky Turgeon-Malette, Xuande Chen, et al. (2023). **Chloride ion permeability of Ultra-High-Performance Fiber-Reinforced Concrete under sustained load**. *Journal of Building Engineering*, Vol. 66, ISSN 2352-7102.

[J.5] Xuande Chen, et al. (2022). **Numerical modeling of 2D hygro-thermal transport in unsaturated concrete with capillary suction**. *Journal of Building Engineering*, Vol. 45, 103640, ISSN 2352-7102.

[J.6] Xuande Chen, et al. (2021). **An Experimental Study on the Sorption in UHPFRC: Adaptation of the DVS Measurement Procedure**. *Springer*, Vol. 200, ISBN 978-3-030-91876-7.

FUNDED PROJECTS

- **Fonds de recherche du Québec - Nature et technologies (FRQNT) - Team** *09. 2024 - 09. 2027*
  Total amount of financing - 150,000 (Canadian dollars)
  - Influence of climate change and concrete weathering on infrastructure management in coastal and road environments

- **FRQNT - NT Strategic Clusters** *03. 2025 - 03. 2026*
  Total amount of financing - 15,500 (Canadian Dollars)
  - Concrete Infrastructure Research Center (CRIB)

- **Institutional Research Fund (FIR)** *05. 2025 - 05. 2026*
  Total amount of financing - 10,000 (Canadian dollars)
  - Development of a multiphysics finite element analysis tool - phase II: Port structure modeling and chemical coupling

- **Institutional Research Fund (FIR)** *01. 2024 - 12. 2024*
  Total amount of financing - 10,000 (Canadian dollars)
  - Development of a long-term multiphysics finite element analysis tool for concrete shoreline structures

- **Mitacs Globalink** *05. 2025 - 09. 2025*
  Total amount of financing - 6,000 (Canadian dollars)
  ◦ Numerical modeling of ion exchange and corrosion in marine infrastructures
- **Mitacs Globalink** *05. 2025 - 09. 2025*
  Total amount of financing - 6,000 (Canadian dollars)
  ◦ Measuring chloride content in concrete infrastructures with digital image analysis
- **Emerging Leaders in the Americas Program (ELAP)** *09. 2024 - 01. 2025*
  Total amount of financing - 8,700 (Canadian Dollar)
  ◦ Dynamic response and control of wind turbine towers subjected to wind and earthquake action
- **Emerging Leaders in the Americas Program (ELAP)** *09. 2024 - 01. 2025*
  Total amount of financing - 8,700 (Canadian Dollar)
  ◦ Generalization of the ultrasonic scattering method for determining concrete strength

TECHNOLOGY TRANSFER

R=REPORT

[R.1] Xuande Chen, et al. (2023). **TransChlor and TransChlor2D computation software user guide**. *User manuel*. September 2023, Rimouski, Canada.

[R.2] David Conciatori, Xuande Chen, et al. (2021). **Prédiction de l'initiation de la corrosion et de la durée de vie des chambres électriques souterraines en béton armé d'Hydro-Québec**. *Research report*, Report nr. CRDPJ 521772 - 2017. NSERC-DRC Grant. October 2021, Quebec, Canada.

[R.3] David Conciatori, Xuande Chen, et al. (2020). **Caractérisation de la traction du béton renforcé de fibres à ultra-haute performance avec corrélation d'image**. *Research report*, Report nr. 019-01v01. NSERC-ENGAGE grant. October 2020, Quebec, Canada.

SKILLS

- **Languages:** French, English, Chinese (mother tongue), Japanese
- **Programming languages:** C++, Python, Matlab, Vb.net, OpenFOAM, Cast3M, HTML, Latex
- **Software:** TransChlor, Abaqus, Ansys, Comsol, Autocad, Sketchup
- **Research:** Concrete and UHPC, Infrastructure Monitoring and Management, Structural Durability, Multiphysics Couplings, Modeling, Programming and Simulation, Finite Elements, Structural Analysis, Porous Multiphase Materials
- **Teaching:** Strength of Materials, Structural Analysis, Structural Design (Concrete and Steel), Infrastructure and Urban Structure Projects, Finite Element and Finite Volume Methods, Introduction to Matlab and C++ programming
- **Skills:** Writing scientific articles for journals and conferences, Leadership, Teamwork, Lecturing, Civil engineering appraisals, Consulting, Civil engineering project management, Civil engineering draftsman

AWARDS AND DISTINCTIONS

- **Best oral presentation** *07. 2024*
  The 6th International Conference on Advances in Civil and Ecological Engineering Research (ACEER 2024)
- **Postdoctoral fellowship** *01.2022 - 08. 2022*
  Natural Sciences and Engineering Research Council of Canada (NSERC) - Hydro Quebec
  ◦ NSERC Postdoctoral Fellowship - RDC - Hydro Québec
- **PhD scholarship** *09. 2017 - 12. 2021*
  Fonds de recherche du Québec - Nature et technologies (FRQNT)
  ◦ Aluminium Research Centre - REGAL @ Laval University
- **Best oral presentation** *04. 2021*
  4th RILEM international conference on microstructure-related durability of cementitious composites
  ◦ Conference at TU Delft
- **Excellence Scholarship** *08. 2018 - 03. 2019*
  Fonds de recherche du Québec - Nature et technologies (FRQNT)
  ◦ Bursary for internships outside Quebec (BSHQ) - 2018-2019
  ◦ Joint PhD program with Northwestern University, USA

SUPERVISION

- **Research advisor** *09. 2024 - now*
  Université du Québec à Rimouski
  ◦ Master's degrees (in progress): Abderrahmane Sghuri, Guerlin Thélusma, Chaimae El Guerfte
  ◦ Doctoral students (in progress): Fatima Ezzahrae Hafidi, Hakim Tahri
- **Co-directing a degree** *01. 2023 - 01. 2025*
  Université du Québec à Rimouski
  ◦ Masters: Manus Saintilma (Federal University of Goiás), Jean Lesly Charles (Universidade Estadual de Santa Cruz)

Service and Leadership

- **Services @ UQAR**
  Université du Québec à Rimouski
  - President of the jury committee: El Kiani Radouane (doctorate), Adrien Thierry (master's degree) and Ayoub Dergaoui (master's degree)
  - Member of the search committee for the recruitment of new faculties
  - Engineering module faculty member
  - Member, Collectif de Recherche Appliquée aux Bioprocédés et à la chimie de l'Environnement (CRABE)
  - Project Manager "Design and layout of a new Structural Laboratory - UQAR".
- **Professional Services**
  Committees, Scientific Journals and Conferences
  - Chairman of the "Structural Engineering" session, The 6th International Conference on Advances in Civil and Ecological Engineering Research
  - Organizer, Forum Innovation Ingénierie, Informatique, Entrepreneuriat (FI3E)
  - Reviewer for the following journals: Journal of Building Engineering (Elsevier), Archives of Civil and Mechanical Engineering (Springer Nature), Materials and Structures (Springer Nature), Materials (MDPI), Buildings (MDPI), American Journal of Civil Engineering (Science PG)
  - Expert and external evaluator for grant and award applications: Canada Foundation for Innovation (CFI), Projet de Recherche en Équipe (FRQNT), Bourses d'excellence pour étudiants étrangers (PBEEE), Bourses de recherche de 1er cycle (BRPC).

Memberships and Affiliations

- **Ordres des Ingénieurs du Québec**, member number: 6055388 — *11. 2023 - now*
- **Concrete Infrastructure Research Center (CRIB)**, regular member — *09. 2024 - now*
- **American Concrete Institute (ACI)**, regular member — *09. 2017 - now*
- **Canadian Society for Civil Engineering (CSCE)**, regular member — *09. 2017 - now*
- **Alliance for Digital Research in Canada** — *12. 2022 - now*

References

1. **Mario Fafard, ing., Ph. D., FCSCE**
   Consultant - Ingénieur civil au CeiAl et responsable du chantier Infrastructures
   AluQuébec
   Email: mario.fafard@aluquebec.com
   Tel: 418 254-2456
   Relation: Academic advisor, Thesis evaluator

2. **Luc Chouinard, ing., Ph. D.**
   Professor, Department of Civil Engineering
   McGill University
   Email: luc.chouinard@McGill.Ca
   Tel: 514 398-6446
   Relation: Collaborator, Co-researcher for the FRQNT-Team grant

3. **David Conciatori, ing., Ph. D.**
   Professor, Department of Civil Engineering
   National Institute of Applied Science
   University of Strasbourg
   Email: david.conciatori@insa-strasbourg.fr
   Tel: +33 (0)3 88 14 47 48
   Relation: PhD Thesis and Postdoc advisor