

Thomas KINSEY P.Eng., Ph.D

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Dynamic and creative researcher, expert in Computational Fluid Dynamics (CFD).
Effective communicator and leader who facilitates teamwork and high-level
results presentation adapted to the end-user.

EXPERIENCE IN CONSULTING

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| 2017-2018 | Consultant for MAVI INNOVATIONS INC.
Provided numerical simulation expertise for the redaction of the technical report <i>River Hydrokinetic Turbine Array Modeling</i> funded by NATURAL RESOURCES CANADA. |
| 2017 | Consultant for OMEGAWATT SARL
Perform parametric study based on CFD simulations to find optimal operating points for an oscillating turbine undergoing large heaving amplitudes. |
| Q2 2016 | Consultant for STC FOOTWEAR
Provided numerical simulation strategies for the optimization of a miniaturized axial turbine. Developed a thermodynamic model. Programed and simulated its behavior in Matlab. |
| 2015-2016 | Consultant for MAVI INNOVATIONS INC.
Provided numerical simulation expertise and supervised graduate students for the redaction of the technical reports <i>Quantifying extractable power in a stretch of river using an array of MHK Turbines</i> and <i>Impact of channel blockage and free-surface proximity on the performance of axial and cross-flow hydrokinetic turbines</i> under funding from MARINE RE-NEWABLES CANADA. |
| Q1 2015 | Consultant for ORTHO-DURO
Provided ideas and solutions to avoid sensor contamination on a molding rig. |
| Q3 2014 | Consultant for ABB
Provided formation on thermo-fluids CFD simulations. |
| Q4 2011 | Founded LAMBDA2 - SIMULATIONS consulting company. |
| Q1 2011 | Consultant for ÉOLO INC.
Optimized the performance of a hydrokinetic turbine with CFD simulations. Provided the client with a simplified solver based on classical flutter theory. |
| 2008 | Consultant for TURBINES ÉOLIENNES VERTICA
Developed CFD modeling approaches for the simulation of 2D and 3D vertical-axis turbines. Built user-friendly Excel interface for simplified data post-treatment. |
| 2007 | Consultant for NUMERICA TECHNOLOGIES INC.
Developed a numerical strategy with moving mesh for the simulation of 2D and 3D flapping foils in ANSYS FLUENT. |

EXPERIENCE IN INDUSTRY

- 2016-2018 | R&D Engineer at TEKNA PLASMA SYSTEMS
Optimized characterization processes of the end product. Developed new line of product.
Contributed to risk analysis to improve the safety of the operation processes.

EXPERIENCE IN RESEARCH

- 2019 | Research Associate at LAVAL UNIVERSITY's CFD lab (Laboratoire de Mécanique des Fluides Numérique)
Coded auxiliary functions (UDF) within the commercial code ANSYS Fluent to implement a simplified in-house turbine model developed for the efficient modeling of hydrokinetic turbine arrays. Work under contract from NATURAL RESOURCES CANADA
- 2014-2016 | Research Associate at LAVAL UNIVERSITY's CFD lab (Laboratoire de Mécanique des Fluides Numérique)
Studied the impact of blockage on the performance of various hydrokinetic turbines technologies in support of the development of industry standards. Standards SMC/IEC TC-114. Supervised graduate students.
- 2010-2014 | Research Project Manager at LAVAL UNIVERSITY's CFD lab (Laboratoire de Mécanique des Fluides Numérique)
Managed academia-business partnership project aiming at the development of a hydrokinetic turbine. Planned resources and budget for experimental campaign. Filed patent applications. Supervised interns and graduate students. Optimized the performance of an oscillating-foils hydrokinetic turbine with CFD simulations.

EXPERIENCE IN TEACHING

- WINTER 2019 | Lecturer at LAVAL UNIVERSITY
Teaching GIN-2001: MATERIAL RESISTANCE, part of the regular undergraduate degree in Mechanical Engineering.
- SEPT 2017 | Created the online program *Leaders de demain*^{MD}
Launched the online program *Leaders de demain*^{MD} with Lyne Marie Germain, an online course in leadership and communication for professionals and entrepreneurs.
www.leadersdedemain.com/programme
- WINTER 2014, 2015 | Lecturer at LAVAL UNIVERSITY
Teaching GIN-3040: THERMAL AND ENERGETIC SYSTEMS ENGINEERING, part of the regular undergraduate degree in Industrial Engineering.
- 2004-2007 | Graduate teaching assistant at LAVAL UNIVERSITY
Courses: Introduction to Aerodynamics ; Applied Fluid Dynamics.

EDUCATION

- 2006-2011 | Ph.D. in Mechanical Engineering (Fluid Mech.), Laval University, Québec, Canada
Thesis: "[Analysis, Optimization and Demonstration of a New Concept of Hydrokinetic Turbine Based on Oscillating Hydrofoils](#)" | Advisor: Prof. Guy DUMAS
- 2004-2006 | M.Sc. in Mechanical Engineering (Fluid Mech.), Laval University, Québec, Canada
- 2000-2004 | B.Sc. in Engineering Physics, Laval University, Québec, Canada

COMMUNITY INVOLVEMENT

2015-2018	Administrator on the board of Créateurs de Paix (www.createursdepaix.net).
MAY - DEC 2014	Vice-chair of the International Network on Offshore Renewable Energy (INORE, inore.org). Provided guidance to new committee members. Organized an international symposium in November 2014 in Halifax.
OCT 2013 - DEC 2014	INORE representative on the International Conference on Ocean Energy (ICOE) board. Organized the INORE plenary at the ICOE conference in November 2014. Provided support and suggestions to the ICOE board for the annual conference content.
JUNE 2012 - DEC 2014	Member of INORE's steering committee. Managed successfully a crowd-funding campaign to fund a new website. Raised sponsorships. Upgraded the visual identity of INORE (new logo).

COMPUTER SKILLS

ENGINEERING	Star-CCM+, ANSYS Fluent, OpenFOAM, Maple, Engrid
PROGRAMING	C, Matlab, LabView
WEB	HTML & CSS, Wordpress, Woocommerce, Stripe, ThriveCart, OptimizePress
WEB HOSTING	Linux server, Digital Ocean, SSL certificates, Nginx, MySQL, PHP
ONLINE COMMUNICATION	WebinarJam, Mailchimp, BlueJeans, Zoom, Skype, Zapier, Articulate Storyline
GRAPHICS	Tecplot 360, ParaView, Adobe Illustrator, Inkscape
TEXT	Microsoft Office Suite, LaTeX
MULTIMEDIA	Audio/video capture, video editing, Sony Vegas Pro, Youtube, Wistia

LANGUAGES

FRENCH:	First language	ENGLISH:	Excellent	SPANISH:	Basic
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SCHOLARSHIPS AND AWARDS

MARCH 2015	Nominated at the Gala du mérite de l'AESGUL for teaching excellence in industrial engineering
NOV 2011	Honor Roll distinction from the Faculty of Graduate and Postdoctoral Studies of Laval University for excellence in the doctoral thesis
JUNE 2012	Best Poster Award, 1 st North American Symposium, International Network on Offshore Renewable Energy (INORE), Massachusetts, USA
MAY 2011	Best Presentation Award, 5 th INORE Symposium, Alcoutim, Portugal
MAY 2010	Best Presentation Award, 4 th INORE Symposium, Devon, UK
MAY 2007	NSERC - Postgraduate Scholarships Program (21 000\$)
MAY 2007	FQRNT - Postgraduate Research Scholarships B2 (20 000\$)
DEC 2006	Hydro-Quebec - Ph.D. Scholarship (15 000\$)
JULY 2005	Hydro-Quebec - M.Sc. Scholarship (3 000\$)

PUBLICATIONS

Journal

M. Picard-Deland, M. Olivier, G. Dumas, and T. Kinsey. “Oscillating-Foil Turbine Operating at Large Heaving Amplitudes”. In: *AIAA Journal* (2019). DOI: [10.2514/1.J058505](https://doi.org/10.2514/1.J058505)

T. Kinsey and G. Dumas. “Impact of channel blockage on the performance of axial and cross-flow hydrokinetic turbines”. In: *Renewable Energy* 103.4 (2016), pp. 239–254. DOI: [10.1016/j.renene.2016.11.021](https://doi.org/10.1016/j.renene.2016.11.021)

E. Gauthier, T. Kinsey, and G. Dumas. “Impact of blockage on the hydrodynamic performance of oscillating-foils hydrokinetic turbines”. In: *J Fluids Eng - Trans ASME* 138.9 (2016), p. 091103. DOI: [10.1115/1.4033298](https://doi.org/10.1115/1.4033298)

T. Kinsey and G. Dumas. “Optimal Operating Parameters for an Oscillating Foil Turbine at Reynolds Number 500,000”. In: *AIAA Journal* 52.9 (2014), pp. 1885–1895. DOI: [10.2514/1.J052700](https://doi.org/10.2514/1.J052700)

T. Kinsey and G. Dumas. “Three-Dimensional Effects on an Oscillating-Foil Hydrokinetic Turbine”. In: *J Fluids Eng - Trans ASME* 134.7 (2012), p. 071105. DOI: [10.1115/1.4006914](https://doi.org/10.1115/1.4006914)

T. Kinsey and G. Dumas. “Optimal Tandem Configuration for Oscillating-Foils Hydrokinetic Turbine”. In: *J Fluids Eng - Trans ASME* 134.3 (2012), p. 031103. DOI: [10.1115/1.4005423](https://doi.org/10.1115/1.4005423)

T. Kinsey and G. Dumas. “Computational Fluid Dynamics Analysis of a Hydrokinetic Turbine Based on Oscillating Hydrofoils”. In: *J Fluids Eng - Trans ASME* 134.2 (Feb. 2012), p. 021104. DOI: [10.1115/1.4005841](https://doi.org/10.1115/1.4005841)

T. Kinsey, G. Dumas, G. Lalande, J. Ruel, A. Mehut, P. Viarouge, J. Lemay, and Y. Jean. “Prototype Testing of a Hydrokinetic Turbine Based on Oscillating Hydrofoils”. In: *Renewable Energy* 36.6 (2011), pp. 1710–1718. DOI: [10.1016/j.renene.2010.11.037](https://doi.org/10.1016/j.renene.2010.11.037)

T. Kinsey and G. Dumas. “Parametric Study of an Oscillating Airfoil in a Power-Extraction Regime”. In: *AIAA Journal* 46.6 (2008), pp. 1318–1330. DOI: [10.2514/1.26253](https://doi.org/10.2514/1.26253)

G. Dumas and T. Kinsey. “Eulerian Simulations of Oscillating Airfoils in Power Extraction Regime”. In: *Proceedings in Advances in Fluid Mechanics VI*. ed. by Rahman and Brebbia. WIT Press, 2006, pp. 245–254

Technical Report

O. Gauvin-Tremblay, T. Kinsey, P.O. Descoteaux, and G. Dumas. *Validation of a Simplified Numerical Model Using Laboratory Testing Results of River Hydrokinetic Turbine Arrays*. Prepared for Natural Resources Canada. May 2019

V. Klaptocz, G. Dumas, S. Bourget, O. G.Tremblay, E. C.Gingras, T Waung, and T Kinsey. *River Hydrokinetic Turbine Array Modeling*. Prepared for Natural Resources Canada. July 2018

V. Klaptocz, G. Dumas, T. Kinsey, and Cousineau J. *Quantifying extractable power in a stretch of river using an array of MHK Turbines*. Prepared for Marine Renewables Canada. Mar. 2016

T. Kinsey, G. Dumas, and E. Gauthier. *Impact of channel blockage and free-surface proximity on the performance of axial and cross-flow hydrokinetic turbines*. Prepared for the International Standards for Marine Energy Conversion Systems, SMC/IEC TC 114. May 2015

Conference (refereed)

E. Gauthier, T. Kinsey, and G. Dumas. “RANS versus Scale-Adaptive Turbulence Modeling for Engineering Prediction of Oscillating-Foils Turbines”. In: *Proceedings of the 21st Annual Conference of the CFD Society of Canada*. Paper CFDSC-2013-186. Sherbrooke, Canada, 2013

T. Kinsey and G. Dumas. “Testing and Analysis of an Oscillating Hydrofoils Turbine Concept”. In: *Proceedings of the 3rd Joint US-European Fluids Engineering Summer Meeting*. Paper FEDSM-ICNMM2010-30869. Montreal, Canada, 2010

T. Kinsey, G. Dumas, and M. Olivier. “Heaving Amplitude Effects on Oscillating Wing Turbines”. In: *Proceedings of the 15th Annual Conference of the CFD Society of Canada*. Paper CFD-2007-1068. Toronto, Canada, 2007

Patent

G. Dumas, T. Kinsey, G. Lalande, J. Lemay, Y. Jean, and M.-A. Campagna. “Oscillating Hydrofoil, Turbine, Propulsive System and Method for Transmitting Energy”. Patent application, CA, CA2011/001107. 2011