BILAL AL TAKI

Assistant Professor | Research Scientist

Mars 22, 1991 — French and Lebanese — 14th arrondissement of Paris
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SUMMARY

I am currently a Project Manager in the Research and Innovative department at Capgemini Engineering, where I lead a dynamic team focused on the development of a floating datacenter powered by renewable energy. I am also a Part-Time Lecturer at Léonard de Vinci Graduate School of Engineering. Nowadays, I am seeking for an Assistant Professor position with an opportunity to pursue my interests in the field of PDEs applied to fluid mechanics systems, and/or in the interface between PDEs and the Artificial Intelligence field.

EXPERIENCE

Project Manager
Capgemini Engineering

Apr 2023– Present   •   Paris, FR

- Design and implement a floating datacenter incorporating renewable energy sources.
- Comprehensive study on the Mechanical Design, Hydrodynamic Stability, Thermodynamic Study, and Energy Study of the data center.

Guest Researcher
Department of Mathematics, TU Kaiserslautern

Sept 2022– Mar 2023   •   Kaiserslautern, DE

- Modeling and studying non-Newtonian fluids for medical and environmental applications (Publication).

Research and Teaching Fellow
LJLL, Sorbonne University

Sept 2021– Aug 2022   •   Paris, FR

- Taught mathematics courses for first and second-academic-year students.
- Establishing new mathematical results concerning problems related to Landslide phenomena (Publication).

Researcher
BICMR, Peking University

Jan 2020 – Aug 2021   •   Beijing, CH

- Developing new achievements to understand the shoreline problem in environmental problems (Publication).

Research and Teaching Fellow
LJLL, Sorbonne University

Jan 2019– Aug 2019   •   Paris, FR

- Taught mathematics courses for first and second-academic-year students.
- Collaborating with colleagues during the CEMRACS'19 conference to study the different numerical schemes devoted to the Compressible Navier-Stokes equations used to model gas dynamics flow (Publication).

Researcher
ANGE, INRIA

Sept 2017 – Dec 2018   •   Paris, FR

- Obtaining a well-posedness result for equations designed to model avalanche phenomena (Publication).
- Taught introductory level courses in mathematics at Sorbonne University.

EDUCATION

PhD in applied mathematics
Lebanese University & Grenoble-Alpes University

2013 – 2016   •   Grenoble, FR – Beirut, LB

Title: On some heterogeneous models in fluid mechanics.
Advisors: Didier Bresch and Raafat Talhouk.

STAY ABROAD

- Germany, Sept-Dec 2022: Stay at TU Kaiserslautern; invitation from Prof. A. Hussein.
- Lebanon, January 2020: Stay at Lebanese University; invitation from Prof. R. Talhouk.
- China, October-December 2019: Stay at BICMR; invitation from Prof P. Zhang.
- Germany, January 2019: Stay at Darmstadt University; invitation from Prof. M. Hieber.

TEACHING ACTIVITIES

For more info., here is my Teaching Portfolio.

- List of courses taught at SU
  - Calculus I and Calculus II
  - Vectorial analysis and multiple integrals
  - Introduction to differential equations
- List of courses taught at USMB
  - Calculus I and Calculus II
  - Statistic
  - Linear Algebra
  - Probability
- List of courses taught at LU
  - Model and numerical method in geosciences
- List of courses taught at ESILV
  - Introduction to Statistics with R
  - Probability

SEMINAR TALKS

- Nov. 2019: Peking University, China.
- Jan. 2019: Darmstadt University, Germany.
- Nov. 2018: Aix-Marseille University, France.
- Mai 2018: University of Paris, France.
- Aug. 2016: Institute of Mathematics of the Czech Academy of Sciences, Czech Republic.

STRENGTHS

PDEs · Renewable Energy · Optimization · Digital Strategy · Project Management · Python · Environmental Sustainability · Machine Learning · Data Science

LANGUAGES

Arabic
French
English

AWARDS

- Boya postdoctoral fellowship

  Project title: Mathematical and numerical analysis for a class of non-Newtonian fluid dynamics equations.

Master degree in mathematics
Lebanese University & Nantes University

📅 2011 – 2013   📍 Nantes, FR – Beirut, LB

Title: Hyperbolic boundary problems and numerical schemes.
Advisors: Jean-Francois Coulombel and Ayman Mourad.

Bachelor degree in mathematics
Lebanese University

📅 2008 – 2011   📍 Beirut, LB

PUBLICATIONS

Visit my account on Google-Scholar for more details about my publications. Please click on the link in each item below to access the papers.

📘 PhD Thesis
- Al Taki, B. (2016). *On some heteregenous model in fluid mechanics*. Retrieved from https://tel.archives-ouvertes.fr/tel-01668531

📄 Journal Articles
- Al Baba, H., Al Taki, B., & Hussein, A. (2023). Remark on the local well-posedness of compressible non-newtonian fluids with initial vacuum. *arXiv preprint*, *2023*. doi:https://arxiv.org/pdf/2305.18564.pdf
- Al Taki, B. (2023). Well-posedness for a class of compressible non-newtonian fluids equations. *Journal of Differential Equations*, *349*, 138–175. doi:https://doi.org/10.1016/j.jde.2022.12.007
- Al Taki, B. (2022). A note on functional inequalities and entropies estimates for some higher-order nonlinear PDEs. *Methods Appl. Anal.*, *29*(2), 161–178. doi:10.4310/MAA.2022.v29.n2.a1
- Al Taki, B., & Lacave, C. (2022). Degenerate lake equations: Classical solutions and vanishing viscosity limit. *Nonlinearity*, *36*(1), 653. doi:10.1088/1361-6544/aca865
- Al Taki, B., Msheik, K., & Sainte-Marie, J. (2021b). On the rigid-lid approximation of shallow water Bingham. *Discrete Contin. Dyn. Syst.*, *Ser. B*, *26*(2), 875–905. doi:10.3934/dcdsb.2020146
- Al Taki, B. (2017a). Global well posedness for the ghost effect system. *Commun. Pure Appl. Anal.*, *16*(1), 345–368. doi:10.3934/cpaa.2017017
- Al Taki, B. (2017b). Viscosity effect on the degenerate lake equations. *Nonlinear Anal.*, *Theory Methods Appl.*, *Ser. A, Theory Methods*, *148*, 30–60. doi:10.1016/j.na.2016.09.017

👥 Proceedings
- Al Taki, B., Atsou, K., Casanova, J.-J., Goudon, T., Lafitte, P., Lagoutière, F., & Minjeaud, S. (2021a). Numerical investigations of the compressible navier-stokes system. In *Esaim: Proceedings and surveys* (Vol. 70, pp. 1–13). Retrieved from https://doi.org/10.1051/proc/202107001

PROJECTS

Here are some projects that I did as a part of my self-training in the Data Science and Artificial Intelligence fields. For a complete list, please consult my GitHub-Page.

Data Science with Python(🔘 , 2022)

The aim of this project is to fit a linear regression or a Ridge Regression model to predict the price using the list of features given on a dataset that contains house sale prices for King County.

Machine Learning with Python(🔘 , 2022)

In this project, we use classification models such as K Nearest Neighbor(KNN), Decision Tree, Support Vector Machine, or Logistic Regression to determine whether a loan is paid off or in based on a dataset about past loans.

Car's generation detection(🔘 , 2022)

The aim of this project is to predict the generation (I or II) of some unknown generation cars based on the features of each generation.

REFEREES

Prof. Alain Miranville
🏛 University of Poitiers, France
✉ alain.miranville@math.univ-poitiers.fr

Prof. Francisco Guillen-Gonzalez
🏛 University of Sevilla, Spain
✉ guillen@us.es

Prof. Pingwen Zhang
🏛 Peking University, China
✉ pzhang@pku.edu.cn

Prof. Christophe Lacave
🏛 Grenoble-Alpes University, France
✉ christophe.lacave@univ-grenoble-alpes.fr

CERTIFICATIONS

Here is a list of courses that I have accomplished on Coursera.

- What is Data Science (**IBM|Online**)
  (Syllabus, Certificate)
- Python for Data Science, AI & Development (**IBM|Online**)
  (Syllabus, Certificate)
- Data Science with Python (**IBM|Online**)
  (Syllabus, Certificate)
- Machine Learning with Python (**IBM|Online**)
  (Syllabus, Certificate).
- Machine Learning Specialization (**Stanford|Online**)
  (Syllabus, Certificate)

RESPONSIBILITIES

- Co-supervisor: M2 Internship of Mme. C. El Hassanieh (Sorbonne University & Inria Paris and Lebanese University).
- Advance Competition: Participation in the jury of "Advance Concours" at EPITA.
- Part-Time-Teacher at ESILV.
- Supervisor: M2 Internship of M. S. SALADRRIAGA BRAN (Ecole Centrale de Nantes).
- Supervisor: M2 internship of I. T'NKEY DAKOU (University of ROUEN)
- Supervisor: ESILV's pedagogical project, which involves ESILV students producing a study for the company.