europass Curriculum vitae

PERSONAL INFORMATION

Timoteo Dinelli

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Date of birth 13 July 1997 | Nationality Italian

RESEARCH INTEREST

I'm a third-year Ph.D. student at Politecnico di Milano, affiliated with the Department of Chemistry, Materials, and Chemical Engineering Giulio Natta. I work within the CRECK modeling laboratory, under the supervision of Professor Alessandro Stagni. My Ph.D. research focuses on using data-driven methods to improve the development of chemical kinetics mechanisms for predicting combustion and pyrolysis behaviors of complex fuels. My academic pursuits revolve around several key areas of interest:

- Setting up and managing an automated framework (SciExpeM) for systematically collecting and analyzing scientific data and kinetic models. Project link.
- Developing robust pipelines to create and validate detailed kinetic mechanisms. These mechanisms are rigorously tested against extensive experimental datasets using data science methodologies.
- Creating automated routines to streamline the optimization of complex kinetic schemes, improving the efficiency of physics-based approaches.
- Implementing algorithms for conducting inverse modeling of high-dimensional problems, aiming to enhance predictive capabilities in complex systems.

WORK EXPERIENCE

October 2023 – June 2024

Visiting Ph.D. Student

Stanford University, Stanford CA, USA.

Visiting Ph.D. student at Stanford University's FxLab, under the guidance of Professor Matthias Ihme. My research focuses on implementing Data Assimilation methods for the joint estimation of state and parameters within chemical kinetic dynamical systems.

EDUCATION AND TRAINING

2021–present

Ph.D. Chemical Engineering

Politecnico di Milano

Dissertation Advisor: Prof. Alessandro Stagni

2019–2021

Master of Sciece in Chemical Engineering

Politecnico di Milano

Thesis Title: Prof. "*Development of an automatic framework for kinetic model validation.*".

Thesis Advisors: Prof. Alessandro Stagni and Prof. Matteo Pelucchi.

2016–2019

Bachelor of Science

Politecnico di Milano

Thesis Title: Prof. "*Applicazioni della stampa 3D per l'ingegneria chimica.*".

Thesis Advisors: Prof. Giulia Luisa Bozzano.

PERSONAL SKILLS

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
	Test of English for International Communication TOEIC (920/990)				
Spanish	B1	B1	B1	B1	B1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Computer Skills

- **Languages**: Proficient in C/C++, Python, Matlab. Experience in Fortran, Julia. Markup languages: LaTeX, HTML, CSS, Markdown.
- **Software**: Most contributions can be found at `https://github.com/tdinelli`. During my PhD I have been, together with Edoardo Ramalli, the main developer and actual mantainer of the SciExpeM ecosystem, which involves and orchestrates different programs and software. I actively contributed to the development of OpenSMOKE++ ecosystem. My contributions include significant enhancements to the core library, as well as the development of functionalities for the ideal reactor and one-dimensional flame solvers, `DoctorSMOKEpp`, and the creation of OptiSMOKEpp. I have developed a python interface, OpenSMOKEpp_Intrefaces, which exposes the key functionalities of the core `OpenSMOKEpp` library. Additionally I have created comprehensive post-processing suite, pySMOKEPostProcessor. Presently, I am engaged in the development of the `CurveMatching` framework, which is tailored towards functional data analysis, with a specific emphasis on chemical kinetic data.

Driving licence: B

PUBLICATIONS

[1] Alessandro Pegurri, **Timoteo Dinelli**, Luna Pratali Maffei, Tiziano Faravelli, and Alessandro Stagni. “Coupling chemical lumping to data-driven optimization for the kinetic modeling of dimethoxymethane (DMM) combustion”. In: *Combustion and Flame* 260 (2024), p. 113202. URL: `https://www.sciencedirect.com/science/article/pii/S001021802300576X`.

[2] **Timoteo Dinelli**, Luna Pratali Maffei, Alessandro Pegurri, Amedeo Puri, Alessandro Stagni, and Tiziano Faravelli. “Automated Kinetic Mechanism Evaluation for e-Fuels Using SciExpeM: The Case of Oxymethylene Ethers”. en. In: Capri, Italy, Aug. 2023, pp. 2023–24–0092. URL: `https://www.sae.org/content/2023-24-0092` (visited on 11/13/2023).

[3] Edoardo Ramalli, **Timoteo Dinelli**, Andrea Nobili, Alessandro Stagni, Barbara Pernici, and Tiziano Faravelli. “Automatic validation and analysis of predictive models by means of big data and data science”. In: *Chemical Engineering Journal* 454 (2023), p. 140149. URL: `https://www.sciencedirect.com/science/article/pii/S1385894722056297`.