FRANCO ZIVCOVICH

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Date of birth	19 September 1991
Nationality	Italian
Languages	Italian, English, Spanish, French
Website	francozivcovich.github.io

Positions

Jan '22 - today	**Research and Development Engineer**
at	Neurodec, Nice, France (full remote)
Project	*"HPC optimization and modeling of biomechanical processes for decoding muscular signals and developing a Myoelectric Digital Twin"*
Tasks	Development of a Python Finite Elements engine, mesh decimation and refinement, setup of High Performance solutions, anticipating research needs.

May '21 - Dec '21	**Post Doctoral**
at	Sorbonne Université, Paris, France
Supervisor	prof. Katharina Schratz
Project	*ERC grant LAHACODE on "Low-regularity and high oscillations: numerical analysis and computation of dispersive evolution equations"*

May '20 - Apr '21	**Fellowship Grant**
at	University of Verona, Verona, Italy
Supervisor	prof. Giacomo Albi
Project	*"Efficient numerical methods for multiscale and control problems with applications"*

Education

Oct '16 - Jan '20	**Ph.D. in Mathematics** (cum Laude)
at	University of Trento, Trento, Italy
Advisor	prof. Marco Caliari
Thesis	*"Backward error accurate methods for computing the matrix exponential and its action"*

Sep '11 - Jul '16	**B.Sc. & M.Sc. in Mathematics** (cum Laude)
at	University of Verona, Verona, Italy
Advisor	prof. Marco Caliari
Thesis	*"Hermite interpolation for the matrix exponential"*

Visiting Academic

Sep '21	**Universidad de Sevilla**, Sevilla, Spain
Responsible	prof. Eleonora Viezzer - Plasma Physics group
Activities	Implementation of advanced numerical schemes for solving large systems of ODEs in the MEGA code.

Sep '18 - Jul '19	**Universitat Politècnica de València**, Valencia, Spain
Responsible	prof. Jorge Sastre - High Perf. Sc. Computing (HiPerSC) group
Activities	Development of new algorithms for computing the matrix exponential in arbitrary precision arithmetic.

Apr '18 - Jun '18	**Université Pierre et Marie Curie**, Paris, France
Responsible	prof. Frédéric Hecht - FreeFem++'s developers team
Activities	Library implementation of simple exponential integrators techniques for solving systems of ODEs.

Sep '17 - Jan '18	**University of Manchester**, Manchester, United Kingdom
Responsible	prof. Nicholas J. Higham - Numerical Linear Algebra (NLA) group
Activities	Development of Krylov subspaces methods for computing the action of φ-function arising in exponential integration.

Sep '15 - Jun '16	**University st. Kliment Ohridksi**, Sofia, Bulgaria
Responsibles	prof. Nadezhda K. Ribarska, prof. Mikhail I. Krastanov
Activities	Erasmus+, main topics: Calculus of Variations and Control Theory.

Publications

Y.A. Bronsard, A. Ostermann, K. Schratz, and F. Zivcovich, *"About Exponential Integrators and Finite Elements Method"*, in preparation.

G. Albi, D. Kalise, C. Segala, and F. Zivcovich, *"Fast and efficient implementation of sparse control problem for the Cucker-Smale model."*, in preparation.

M. Caliari, F. Cassini, and F. Zivcovich, *"A μ-mode approach for computing matrix φ-functions appearing in exponential integration"*, submitted.

F. Zivcovich, J. Sastre, J. Ibañez, and E. Defez, *"Krylov on-the-fly backward error estimate for matrix exponential approximation by Taylor algorithm"*, submitted.

B. Li, K. Schratz, and F. Zivcovich, *"A second-order low-regularity correction of Lie Splitting for the semilinear Klein–Gordon equation."*, accepted for publication.

M. Caliari, F. Cassini, and F. Zivcovich, *"BAMPHI: matrix and transpose-free algorithm for computing the action of combinations of φ-functions"*, J. Comput. Appl. Math. 423 (2023) 114973.

M. Caliari, F. Cassini, and F. Zivcovich, *"A μ-mode BLAS approach for multidimensional tensor-structured problems"*, Numer. Algorithms (2022).

M. Caliari, F. Cassini, L. Einkemmer, A. Ostermann, and F. Zivcovich, *"A μ-mode integrator for solving evolution equations in Kronecker form"*, J. Comput. Phys. 455 (2022) 110989.

M. Caliari, F. Cassini, and F. Zivcovich, *"Approximation of the matrix exponential for matrices with a skinny field of values"*, BIT 60 (4) (2020) 1113–1131.

F. Zivcovich, *"Fast and accurate computation of divided differences for analytic functions, with an application to the exponential function"*, Dolomites Res. Notes Approx. 12 (1) (2019) 28–42.

M. Caliari, and F. Zivcovich, *"On-the-fly backward error estimate for the matrix exponential approximation by Taylor algorithm"*, J. Comput. Appl. Math. 346 (2019) 532–548.

M. Caliari, P. Kandolf and F. Zivcovich, *"Backward error analysis of polynomial approximations for computing the action of the matrix exponential"*, BIT 58 (4) (2018) 907–935.

Conferences

"NUMASP 2021", Verona, Italy. I presented "Numerical aspects of solving sine-Gordon equation using Exponential Integrators.", December 2021.

"NUMDIFF 2021", Halle (Saale), Germany. I presented "BAMPHI: matrix and transpose-free algorithm for computing the action of combinations of φ-functions in exponential integrators", September 2021.

"SMAI 2021", Montpellier, France. I presented "BAMPHI: matrix and transpose-free algorithm for computing the action of combinations of φ-functions in exponential integrators", June 2021.

"MATA 2020", Perugia, Italy. I presented the poster "Fast and accurate computation of divided differences for analytic functions, with an application to the exponential function", January 2020.

"ICIAM 2019", Valencia, Spain. I presented "Backward error analysis of Krylov approximations for computing the action of the matrix exponential", July 2019.

"BIRS 18w5152 Integrating the Integrators for Nonlinear Evolution Equations: from Analysis to Numerical Methods, High-Performance-Computing and Applications", Banff, Canada. I presented "Backward error analysis for Krylov approximations to matrix exponential", December 2018.

"LSSC 2017", Sozopol, Bulgaria. I presented "Newton interpolation at Hermite-Leja points", June 2017.

UNIVERSITY-LEVEL TEACHING ACTIVITIES				
A.Y.	SEM.	WHERE	WHAT	HOURS
2023-2024	I	University of Verona, IT	School of Medical System Engineering – Calculus I	32
2023-2024	I	University of Verona, IT	B.Sc. Computer Science and Bioinformatics – Calculus I	24
2023-2024	Su.	University of Verona, IT	School of Medicine & Surgery, preparation to the Admission Test	24
2023-2024	Su.	University of Verona, IT	"Corso Zero": pre-university general Mathematics	20
2022-2023	II	University of Verona, IT	"O.F.A.": all scientific degrees' minimal-admission-requirements	30
2022-2023	Su.	University of Verona, IT	School of Medicine & Surgery, preparation to the Admission Test	24
2022-2023	Su.	University of Verona, IT	"Corso Zero": pre-university general Mathematics	40
2021-2022	II	University of Verona, IT	"O.F.A.": all scientific degrees' minimal-admission-requirements	16
2021-2022	Su.	University of Verona, IT	"Corso Zero": pre-university general Mathematics	60
2020-2021	I	University of Verona, IT	B.Sc. Biotechnologies – Calculus I	48
2020-2021	Su.	University of Verona, IT	"Corso Zero": pre-university general Mathematics	60
2019-2020	II	University of Verona, IT	M.Sc. Mathematics – Partial Differential Equations	16
2019-2020	II	University of Verona, IT	"O.F.A.": all scientific degrees' minimal-admission-requirements	15
2019-2020	I	University of Verona, IT	B.Sc. Bioinformatics – Calculus I	24

HIGHSCHOOL-LEVEL TEACHING ACTIVITIES				
YEAR	SEM.	WHERE	WHAT	HOURS
2019-2020	I	Liceo Montanari, Verona, IT	Mathematics & Physics	40
2019-2020	II	Liceo Montanari, Verona, IT	Mathematics & Physics (special education)	27

TOTAL TEACHING HOURS: 500