Federico Agustín Caccia

Curriculum Vitæ, November 2018

Personal Data

Name: *Federico Agustín Caccia*

Date and place of birth: *8th February 1989, Corrientes, Argentina*

Passport: *AAE717772*

Adress: *Av. Bustillo 9500, San Carlos de Bariloche (CP:8400), Argentina*

Civil status: *Single*

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Github: `www.github.com/fedecaccia`

Linkedin: `www.linkedin.com/in/fedecaccia`

ResearchGate: `www.researchgate.net/profile/Federico_Caccia2`

Education

2017 **Master degree in Engineering**, *Balseiro Institute, Cuyo National University and National Atomic Energy Commission*, San Carlos de Bariloche, Argentina.
Thesis: *Multiscale coupling in fluid-dynamic calculations*.
Director: PhD. Enzo A. Dari.

2014 **Nuclear Engineer**, *Balseiro Institute, Cuyo National University and National Atomic Energy Commission*, San Carlos de Bariloche, Argentina.
Thesis: *Conceptual Design of a Fast Nuclear Reactor.*
Director: PhD. Eduardo Villarino.

2011 **Student in Civil Engineer**, *Facultad de Ciencias Exactas, Ingeniería y Agrimensura, Universidad Nacional de Rosario*, Rosario, Argentina.
Attended the first two years of the career until obtaining the scholarship of degree in Balseiro Institute.

Professional Experience

2018 **Engineering Consultant**, *SIC-TEC*, Mendoza, Argentina.
CFD using OpenFOAM modelling O&G systems.
References: Eng. Eduardo Tano (tano@sic-tec.com.ar).

2018 **Blockchain Research**, *CoinFabrik*, Buenos Aires, Argentina.

CoinFabrik is a software company focused on Blockchain Technologies, FinTech and Smart Contracts Development. References: Eng. Sebastian Raul Wain (sebastian.wain@nektra.com).

- Project: Cryptoassets quantitative analysis.
  - Duration: January 2018 - November 2018.
  - Description: Correlation and cointegration analysis in cryptoassets. Trading strategies analysis, mainly focus on statistical arbitrage and mean reversion algorithms.
  - Responsibilities and achievements: data analysis and code development.
- Project: Online News Clustering.
  - Duration: February 2018 - April 2018.
  - Description: An incremental clustering of text documents code was developed using natural language processing techniques. The program is composed by a web scrawler and a main alogrithm which performs online clustering on breaking news, tweets and social media articles.
  - Responsibilities and achievements: research and code development.
- Project: Mofiler.
  - Duration: June 2018 - July 2018.
  - Description: Mofiler is a decentralized platform for the gathering, enrichment and trading of massive data generated by millions of devices.
  - Responsibilities and achievements: Token economics, which includes MOFI utility token and MOFX security token valuations.
- Project: Taringa! decentralization.
  - Duration: August 2018 - October 2018.
  - Description: Decentralization of Taringa!, the latin-american social network with 500K daily active users.
  - Responsibilities and achievements: Decentralized platform design, including architecture, token dynamics, incentives and economics.
- Project: Front-end trading exchange.
  - Duration: July 2018 - October 2018.
  - Description: Centralized cryptoassets trading exchange font-end development.
  - Responsibilities and achievements: Product owner.
- Coinfabrik blog finance articles:
  - Responsibilities and achievements: research and writing.
  - Articles:
    - *An Efficient Algorithm to Exploit Arbitrage Opportunities in Crypto Markets*
    - *A Summary of Satis Group's Latest Cryptoasset Valuation Report*
    - *Analyzing Blockchain Networks with Metcalfe's and Odlyzko's laws*
    - *A Review on Cryptoasset Valuation Frameworks*
    - *What I have learned from my arbitrage experiences with cryptoassets*

2014–2017 **Nuclear Engineer**, *Computational Mechanics Department in National Atomic Energy Commission*, San Carlos de Bariloche, Argentina.
Basic Engineering Projects for Nuclear Research Reactors.
Development of thermohydraulic calculation codes.
Director: PhD. Enzo A. Dari (darie@cab.cnea.gov.ar), Co-director: PhD. Mariano Cantero (mcantero@cab.cnea.gov.ar).
Responsibilities and achievements:

- Validation of the calculation line for the model of the Second Shutdown System of the RA-10 reactor.
- Multiscale analysis of the Second Shutdown System of the RA-10 reactor.
- Fluid dynamics simulations of biphasic flow with the techniques of *volume of fluid* using OpenFOAM and *level-set* using Par-GPFEP.
- Development of Newton master code for explicit and implicit coupling of calculation programs.
- Coupling of neutronic codes (PUMA, Fermi) and thermohydraulic codes (RELAP5, Par-GPFEP and other own development codes).

2014 **Engineering Consultant**, *SIC-TEC*, Mendoza, Argentina.
Wind load modeling on structures under construction using OpenFOAM.
References: Eng. Eduardo Tano (tano@sic-tec.com.ar).

2013-2014 **Undergraduate intern**, *Nuclear Engineering Department in INVAP S.E.*, San Carlos de Bariloche, Argentina.
Nuclear engineering thesis: *Conceptual Design of a Fast Reactor*.
Director: PhD. Eduardo Villarino (men@invap.com.ar).

Teaching Experience

2016 **Auxiliar teaching ad-honorem**, *Matemática 2A (Matemathics 2A) and Métodos Numéricos (Numerical Methods), Balseiro Institute, Cuyo National University and National Atomic Energy Commission*, San Carlos de Bariloche, Argentina.
References: PhD. Javier Fernandez (jfernand@cab.cnea.gov.ar), PhD. Enzo A. Dari (darie@cab.cnea.gov.ar).

Languages

Spanish **Native language.**

English **Fluent (reading, writing). Intermediate (speaking).**

French **Basic communication skills.** *A1 international certificate, 2015.*

Technical Skills

Scientific Programming Languages

`C`	Advanced level	`C++`	Advanced level
`CUDA C`	Intermediate level	`Fortran`	Intermediate level
`Octave`	Intermediate level	`Python`	Advanced level
`Scripting`	Intermediate level		

Back-end Programming

`MongoDB`	Intermediate level	`MySQL`	Basic level
`PHP`	Basic level		

Front-end Programming

`CSS`	Intermediate level	`HTML`	Intermediate level
`Javascript`	Basic level	`Markdown`	Basic level

Game Programming

`Unity 3D` Intermediate level

Other

- Operating systems: Debian GNU/Linux, Microsoft Windows
- Scientific libraries: cuRAND, GNU Scientific Library (GSL), Matplotlib, NumPy, OpenMP, OpenMPI, Pandas, PETSc, PyBrain, PyFoam, PyMongo, SLEPc, ScyPy, Scikit-learn, Thrust
- Scientific software: GNU Project Debugger (GDB), Gmsh, Gnuplot, Mathematica, MATLAB, OpenFOAM, Origin, Paraview, SALOME
- Technical and scientific documentation: Latex, Microsoft Office
- Version control software systems: Git, Mercurial

Grants and fellowships

2017 Scolarship to attend *Latin American Summer School in Computational Neuroscience LACONEU 2017*.

2014–present Professional perfectioning grant *A1P* from the National Atomic Energy Commission to work in Computational Mechanics Department.

2011–2014 Scholarship from the National Atomic Energy Commission to study Nuclear Engineering at the Balseiro Institute.

Specialization courses

Courses taken during Masters:

2016 *Modeling of thermohydraulic systems in reactors using plant codes* – Professor: PhD. Pablo Zanocco, 80 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2015 *Introduction to computing with GPUs*, Professor: PhD. Flavio D. Colavecchia, 64 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2015 *Introduction to distributed processing*, Professor: PhD. Enzo A. Dari, 60 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2015 *Neural Networks*, Professor: PhD. Germán Mato, 128 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2014 *Finite element method*, Professor: PhD. Enzo Dari, 120 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2014 *Numerical methods in fluid mechanics*, Professor: PhD. Federico Teruel, 80 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2013 *Reactor analysis and calculation*, Professor: PhD. Edmundo Lopasso, 80 hs, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

Other courses

2018 *SQL and Relational Databases*, Online course taken at cognitiveclass.ai, an IBM initiative. Authenticity of this certificate can be validated by going to: https://courses.cognitiveclass.ai/certificates/53cf83156de943e3810cb45563eeec12

2018 *Data Analysis with Python*, Online course taken at cognitiveclass.ai, an IBM initiative. Authenticity of this certificate can be validated by going to: https://courses.cognitiveclass.ai/certificates/1e4b7f8f9b9c4258927b7e663f3165b5

2018 *Deep learning with tensorflow*, Online course taken at cognitiveclass.ai, an IBM initiative. Authenticity of this certificate can be validated by going to: https://courses.cognitiveclass.ai/certificates/3043c010ae9745818c7917e771f79954

Publications

Technical Reports at National Atomic Energy Commission

2015 *Hydrodynamic analysis of the Second Shutdown System of the RA-10 reactor*, Ludmila M. Rechiman, Mariano Cantero, Enzo A. Dari, Federico A. Caccia and Andrés Chacoma, Technical Report CNEA IN-ATN40MC-04/2015, San Carlos de Bariloche, Argentina.

Publications in international journals

2017 *Three-dimensional hydrodynamic modeling of the Second Shutdown System of an experimental nuclear reactor*, Ludmila M. Rechiman, Mariano Cantero, Federico A. Caccia, Andrés Chacoma and Enzo A. Dari, Nuclear Engineering and Design, vol 319, pp 163-175, doi: 10.1016/j.nucengdes.2017.04.024.

Presentations at congresses with publication in acts:

2016 *Multiscale coupling in fluid-dynamic calculations*, Federico A. Caccia and Enzo A. Dari, XXII Congress on Numerical Methods and its Applications ENIEF 2016, National Technologycal University, Córdoba, Argentina. Published in *Mecánica Computacional* Vol XXXIV, págs. 1955-1972.

2016 *Validation of a multiscale model of the second shutdown system of an experimental nuclear reactor*, Ludmila M. Rechiman, Mariano Cantero, Federico A. Caccia and Enzo A. Dari, XXII Congress on Numerical Methods and its Applications ENIEF 2016, National Technologycal University, Córdoba, Argentina. Published in *Mecánica Computacional* Vol XXXIV, págs. 2199-2215.

Conferences and courses attended:

2017 *Evolution of neural computation*, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2017 *Latin American Summer School in Computational Neuroscience LACONEU 2017*, Project: *Sensory adaptation without plasticity in the V1 visual cortex*, Institute of Complex Systems of Valparaíso, Valparaíso, Chile.

2017 *Computational Neuroscience: new trends and challenges for the 2030*, Institute of Complex Systems of Valparaíso, Valparaíso, Chile.

2016 *Machine Learning*, Balseiro Institute, Cuyo National University and National Atomic Energy Commission, San Carlos de Bariloche, Argentina.

2016 *XXII Congress on Numerical Methods and its Applications ENIEF 2016*, National Technologycal University, Córdoba, Argentina.

2015 *Plasma processing of radioactive wastes: process engineering, flue gas and solid wastes*, organized by the Nuclear Material Department, the National Program of Radioactive Waste Management and the International Atomic Energy Agency, Bariloche Atomic Center, San Carlos de Bariloche, Argentina.

2014 *XXI Congress on Numerical Methods and its Applications ENIEF 2014*, Bariloche Atomic Center, San Carlos de Bariloche, Argentina.

Software development

`Hermes` Hermes is a crypto platform to test and run trading algorithms (https://www.github.com/fedecaccia/hermes).

`Online News Clustering` Online News Clustering is a natural language processing code that performs incremental clustering over news, tweets and other social media articles (https://www.github.com/fedecaccia/Online-News-Clustering).

`Newton` Newton is a master code that solves explicit and implicit coupling in nonlinear calculations, for example, in fluid-dynamic, neutronic and termohydraulic coupling, etc. (https://www.github.com/fedecaccia/newton).

`Par-GPFEP` Par-GPFEP is a general purpose finite element program designed to solve mechanic problems involving multiphase flows, turbulent models, free-surface tracking, heat transfer, fluid-structure interaction and others.

Federico Agustín Caccia
November 27, 2018