Ismaël Bouya

Software engineer

Normalien from the ENS in Paris
Doctor in applied mathematics

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Professional experience

2022– : **Software Engineer at NovaDiscovery**

- Responsible for creation of an external API.

2018–2022 : **Software Engineer at Fretlink**

- Responsible for tracking and connections with third-parties (both carrier-side and client-side).
- After 2021: joined the NOC team in addition to the developper position.

Since 2019, free time : **Member of the CHATONS collective** `https://chatons.org` Proposing services based exclusively on free and open source softwares. Reproductible infrastructure thanks to NixOS.

2014–2018 : **Software Engineer at Captain Train/Trainline**

- Technical lead for the Dach region (Germany, Austria, Switzerland).
- After 2016: joined the NOC team (responsible for the infrastructure) in addition to the developper position.

2013–2014 : **Postdoctor at KTH, Stockholm**

- **Project** Creation of a virtual wind tunnel for the simulation of an airfoil.
- **Development** Documentation and addition of features to a numerical solver for the Navier–Stokes equations based on spectral elements methods, nek5000 (`http://nek5000.mcs.anl.gov/`)

2009–2013 : **PhD in applied mathematics** at Université Paris-Diderot (Paris 7)

- **Project** Numerical and theoretical study of the stability of the magnetohydrodynamics system.
- **Teaching** at Université Paris Diderot.
- **Development** of two parallel codes for solving the induction equation (MPI/OpenMP and multi-GPU with CUDA).
- **Supervise** a Master and PhD student for the future development of the GPU code.

Since 2009 : **Volonteer web developer** Richie `http://europe-richie.org/`, Osteopathy `http://osteopathe-cc.fr/`, Connexionswing `http://connexionswing.com/`, Other associations

Since 2008 : **Co-supervision and organisation of trainings to free softwares** LaTeX, git, python,...

Academic career

2009–2013 : **PhD in applied mathematics** under the advise of David Gérard-Varet and Emmanuel Dormy: Instabilities in magnetohydrodynamics, mention "très honorable".

2007–2009 : **M2 Équations aux dérivées partielles et calcul scientifique** in Orsay ("PDE and scientific computing"), master thesis with David Gérard-Varet: instabilities in magnetohydrodynamics, anti-dynamo theorems, mention "assez bien".

2007–2008 : **"Agregation" in mathematics** (the highest teaching diploma in France), option scientific computing.

2006–2010 : National competitive entrance examination to the École Normale Supérieure in Mathematics.

2003–2006 : **"Classes préparatoires"** in Paris, Lycée Saint-Louis.

Competences

Languages : **French** native. **Anglais** fluent (C1 certification / TOEIC 900). **German** correct level, good understanding. **Swedish** rudiments.

Development :
Programming C, Fortran, Java, Ruby (Rails), Haskell, Nix
Scripting Python, bash, perl
Libraries OpenMP, MPI, CUDA
Web PHP (Symfony), Javascript (Ember)
HTML/XML, CSS/XSL
Databases MySQL, SQLite, pgSQL
Version control Git, Subversion
Infrastructure Terraform, libvirt
Deployment/Continuous integration Puppet, Ansible, Gitlab-CI

Knowledge :
Network architecture, **Protocols** TCP/IP, HTTP
Office Office, OpenOffice/LibreOffice, LaTeX,
Operating system Windows (Deep up to XP), Linux (Deep), MacOS (Experienced user)
Administration of servers and computers personnal and backup server at the ENS.

Teaching experience

2013 : Supervision of a formation to Python at ENS for teachers in "classes préparatoires".

2010-2013 : Teaching at the UPD (Université Paris Diderot) in Paris in mathematics and computing (Licence, 6 semesters).

2009-2010 : Teaching at the UPMC (Université Pierre et Marie Curie) in Paris in mathematics (Licence, 1 semester).

2009,2010 : Intensive courses to german student coming to France (association B.I.L.D.)

Since 2008 : Formation to open source softwares (LaTeX, git,...)

Computing projects selection

Fortran OpenMP/MPI : Porting of a numerical simulation code to parallel (CPU) architecture (PhD).

Use of a spectral element methods simulation program (`http://nek5000.mcs.anl.gov/index.php/Main_Page`) during postdoc. Current project: documentation and adding of new features.

CUDA : End of PhD: starting of a project for numerical simulation on multi-GPU (`http://www.cyi.ac.cy/cscpostersession/Cameron.pdf`). Helping at the evolution of the project since then.

Web : Richie website: `http://www.europe-richie.org`. I wrote the whole core part of the website: researcher directory, organiser, bibliographical database, event organisation, mailing-list, full multilingual and user interface.

MesoPSL : Selected project by the "Challenge MesoPSL" for the opening of a new 1024-core machine in this computing center. Prize: exclusive access to the machine for a month period to make computations.

Publications

Articles

Instability of the magnetohydrodynamics system at small but finite Reynolds number : (2013) *SIAM J. Math. Anal.*, 45(1), 307–323. (`http://dx.doi.org/10.1137/110854655`)

Instability of the magnetohydrodynamics system at vanishing Reynolds number : (2013) *Z. Angew. Math. Phys.*, 64(6) 1689—1698. (`http://dx.doi.org/10.1007/s00033-013-0309-1`

Revisiting the ABC flow dynamo : (2013) *Phys. Fluids* 25, 037103. (`dx.doi.org/10.1063/1.4795546`)

Toward an asymptotic behaviour of the ABC dynamo : (2015) *EPL (Europhysics Letters)* 110(1). (`http://dx.doi.org/10.1209/0295-5075/110/14003`)

Memoir

Ondes à la surface de l'eau : (Waves at the surface of water) under the advise of Éric Serré.

Instabilité en magnétohydrodynamique et théorèmes anti-dynamo : (Instabilities in magnetohydrodynamics and anti-dynamo theorems) Master thesis under the advise of David Gérard-Varet.

Théorèmes anti-dynamo en magnétohydrodynamique, instabilité : To validate the last year at ENS.

Instabilités en magnétohydrodynamique : PhD Thesis.