Martí Bosch

Urban sprawl, Python and complexity

Education

2016-2020 (expected) **PhD in Civil and Environmental Engineering**; **École Polytechnique Fédérale de Lausanne** (Lausanne, Switzerland)

2015-2016 **MSc in Informatics**; **École Nationale Supérieure d'Informatique et Mathématiques Appliquées de Grenoble** (Grenoble, France)

Specialization: Artificial Intelligence and the Web

Thesis title: A framework for measuring urban sprawl from crowd-sourced data

2010-2014 **BSc in Industrial Technology Engineering**; **Escola Tècnica Superior d'Enginyeria Industrial de Barcelona** (Barcelona, Spain)

Thesis title: Automated refactoring for size reduction of CSS style sheets

Experience

Current (since Sep 2016) **Doctoral Assistant**; **Urban and regional planning community (CEAT)**, EPFL (Lausanne, Switzerland)

Assessment of the impacts of urban patterns on the environment, transportation and human well being

Feb-Jul 2016 **Research Intern**, **STEEP team**, INRIA Rhone-Alpes (Grenoble, France)

Evaluation of the literaure of urban sprawl, and creation of a framework to assess it using crowd-sourced data

Jun-Sep 2015 **Summer Student**, **IT department**, CERN (Geneva, Switzerland)

Development of the DataTV project, aimed to display a network with the real-time data throughput of CERN's experiments

Feb-Jul 2014 **Research Intern**, **Tyrex team**, INRIA Rhone-Alpes (Grenoble, France)

Exploration semantics-preserving refactoring possibilities for Cascading Style Sheets based on logical reasoning

Technical Experience

PhD Courses **Scientific programming for Engineers** - Lecturer: Gillaume Anciaux

Topics in Computational Social Science - Lecturer: Robert West

Optimization and simulation - Lecturer: Michel Bierlaire

Summer School on Reproducibility in Computational Sciences

Python avancé pour le calcul scientifique

Programming Languages

Python: expert proficiency in the PyData stack and geospatial libraries. Good command of performance-optimization tools like Cython, Numba, Dask and PyBind. Advanced proficiency in Flask and Django web frameworks.

C/C++: good command of object-oriented C++, templates and the standard library

Other: expert proficiency with the Emacs editor, LaTeX and git. Advanced proficiency in bash, Java, Matlab, R, SQL, HTML, CSS, JavaScript.

Open Source

PyLandStats: open-source Pythonic library to compute landscape metrics within the PyData stack (NumPy, pandas, matplotlib…)

PySTREAM: Python implementation of the STREAM hydrological rainfall-runoff model

Publications

R. Jaligot, J. Chenal, M. Bosch, S. Hasler. ***Historical dynamics of ecosystem services and land management policies in Switzerland***. **Ecological Indicators** 2019 101, 81-90

L. Gervasoni, M. Bosch, S. Fenet, P. Sturm. ***Calculating spatial urban sprawl indices using open data***. **15th International Conference on Computers in Urban Planning and Urban Management** 2017

L. Gervasoni, M. Bosch, S. Fenet, P. Sturm. ***A framework for evaluating urban land use mix from crowd-sourcing data***. **IEEE International Conference on Big Data** 2016

M. Bosch, P. Genevès. N. Layaïda. ***Reasoning with Style***. **International Joint Conference on Artificial Intelligence** 2015

M. Bosch, P. Genevès. N. Layaïda. ***Automated refactoring for size reduction of CSS style sheets***. **Proceedings of the 2014 ACM symposium on Document engineering** 2014

Languages

- Catalan (mothertongue), Spanish (native)
- English, French (full professional proficiency, C1)
- Italian (limited working proficiency, B1)
- German (elementary proficiency, A1)

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