

# Martí Bosch

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## Education

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

*Directors: Jérôme Chenal and Stéphane Joost*

**Sep 2015-Jul 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.*

*Directors: Serge Fenet, Peter Sturm*

**Sep 2010-Jul 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. Director: Pierre Genevès*

## 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. Directors: Jérôme Chenal, Stéphane Joost

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

Evaluation of the literature of urban sprawl, and creation of a framework to assess it using crowd-sourced data. Directors: Serge Fenet, Peter Sturm

**Jun 2015-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. Director: Xavier Espinal

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

Exploration semantics-preserving refactoring possibilities for Cascading Style Sheets based on logical reasoning. Director: Pierre Genevès

## Technical Experience

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|-----------------------|---|
| PhD Courses           | <b>Scientific programming for Engineers</b> - Lecturer: Gillaume Anciaux  |
|                       | <b>Topics in Computational Social Science</b> - Lecturer: Robert West   |
|                       | <b>Optimization and simulation</b> - Lecturer: Michel Bierlaire   |
|                       | <b>Summer School on Reproducibility in Computational Sciences</b>   |
|                       | <b>Python avancé pour le calcul scientifique</b>  |
| Programming Languages | <b>Python:</b> expert proficiency in the scientific Python stack and geospatial libraries. Good command of performance-optimization tools like Cython, Numba, Dask and PyBind. Advanced proficiency in Flask and Django web frameworks. |
|                       | <b>C/C++:</b> good command of object-oriented C++, templates and the standard library   |
|                       | <b>Other:</b> expert proficiency with the Emacs editor, LaTeX and git. Advanced proficiency in bash, Java, Matlab, R, SQL, HTML, CSS, JavaScript.   |
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## Languages

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

## Publications

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|------------------------|--|
| Submitted manuscripts  | Bosch, M., Locatelli, M., Hamel, P., Remme, R., Chenal, J., & Joost, S. (2020): A spatially-explicit approach to simulate urban heat islands in complex urban landscapes. <i>Under review</i> in Geoscientific Model Development. <a href="https://doi.org/10.5194/gmd-2020-174">doi.org/10.5194/gmd-2020-174</a>  |
|                        |  |
| Peer-reviewed journals | Bosch, M. (2020): DetecTree: Tree detection from aerial imagery in Python. Journal of Open Source Software, 5(50), 2172. <a href="https://doi.org/10.21105/joss.02172">doi.org/10.21105/joss.02172</a>   |
|                        | Bosch, M., Jaligot, R., & Chenal, J. (2020). Spatiotemporal patterns of urbanization in three Swiss urban agglomerations: insights from landscape metrics, growth modes and fractal analysis. Landscape Ecology, 1-13. <a href="https://doi.org/10.1007/s10980-020-00985-y">doi.org/10.1007/s10980-020-00985-y</a> |
|                        | Bosch, M. (2019). PyLandStats: An open-source Pythonic library to compute landscape metrics. PLoS One, 14(12). <a href="https://doi.org/10.1371/journal.pone.0225734">doi.org/10.1371/journal.pone.0225734</a>   |
|                        | Bosch, M., Chenal, J., & Joost, S. (2019). Addressing urban sprawl from the complexity sciences. Urban Science, 3(2), 60. <a href="https://doi.org/10.3390/urbansci3020060">doi.org/10.3390/urbansci3020060</a>  |
|                        | Bosch, M. (2019). swisslandstats-geopy: Python tools for the land statistics datasets from the Swiss Federal Statistical Office. Journal of Open Source Software, 4(41), 1511. <a href="https://doi.org/10.21105/joss.01511">doi.org/10.21105/joss.01511</a>   |

Jaligot, R., Chenal, J., & Bosch, M. (2019). Assessing spatial temporal patterns of ecosystem services in Switzerland. *Landscape Ecology*, 34(6), 1379-1394. [doi.org/10.1007/s10980-019-00850-7](https://doi.org/10.1007/s10980-019-00850-7)

Jaligot, R., Chenal, J., Bosch, M., & Hasler, S. (2019). Historical dynamics of ecosystem services and land management policies in Switzerland. *Ecological indicators*, 101, 81-90. [doi.org/10.1016/j.ecolind.2019.01.007](https://doi.org/10.1016/j.ecolind.2019.01.007)

Kemajou, A., Jaligot, R., Bosch, M., & Chenal, J. (2019). Assessing motorcycle taxi activity in Cameroon using GPS devices. *Journal of transport geography*, 79, 102472. [doi.org/10.1016/j.jtrangeo.2019.102472](https://doi.org/10.1016/j.jtrangeo.2019.102472)

## Conference proceedings

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

Gervasoni, L., Bosch, M., Fenet, S., & Sturm, P. (2016). A framework for evaluating urban land use mix from crowd-sourcing data. In 2016 IEEE International Conference on Big Data (Big Data) (pp. 2147-2156). IEEE. [doi.org/10.1109/BigData.2016.7840844](https://doi.org/10.1109/BigData.2016.7840844)

Bosch, M., Genevès, P., & Layaïda, N. (2015). Reasoning with style. In Twenty-Fourth International Joint Conference on Artificial Intelligence.

Bosch, M., Genevès, P., & Layaïda, N. (2014). Automated refactoring for size reduction of CSS style sheets. In Proceedings of the 2014 ACM symposium on Document engineering (pp. 13-16). [doi.org/10.1145/2644866.2644885](https://doi.org/10.1145/2644866.2644885)

## Talks

### Conferences

Bosch, M. (2020). Analysis with PyLandStats of the evolution of the Swiss forests. Workshop in the Young Modellers in Ecology Workshop. Online conference. Mai 26-28

Bosch, M. (2020). PyLandStats: computing landscape metrics in the Python ecosystem. Talk in the Young Modellers in Ecology Workshop. Online conference. Mai 26-28

Bosch, M. (2020). DetecTree: a Python library for tree detection from aerial imagery. AI & Cities track, Applied Machine Learning Days. Lausanne. Jan 25-29

Bosch, M. (2019). Spatiotemporal Patterns of Urbanization in Three Swiss Urban Agglomerations: Insights from Landscape Metrics, Growth Modes and Fractal Analysis. Theoretical Geography VVOIP Debates, Debate 3.1 - Fractals and Multifractals. Online colloquium. Nov 15-16

Bosch, M., Genevès, P., & Layaïda, N. (2014). Automated refactoring for size reduction of CSS style sheets. ACM symposium on Document engineering. Fort Collins, Colorado. Sep 16-19

## Service

### Journal peer review

Geoscientific Model Development  
Journal of Open Source Software