

Computational scientist with 3+ years of research experience in machine learning, neural networks and evolutionary algorithms with main applications to genomic data analysis.

## EDUCATION

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- M.Sc. Engineering Mathematics**      **Politecnico di Torino (IT)**      2017 – 2019  
Acquired skills: bioinformatics, mathematical modeling for biology, neural networks, optimisation, statistics
- B.Sc. Computer Engineering**      **Politecnico di Torino (IT)**      2013 – 2017  
Acquired skills: programming, relational databases

## WORK EXPERIENCE

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- Cofounder, Computational Scientist**      **Bactell Inc. (US)**      04/2018 – present  
Invention and development of rapid, sensitive, and predictive methods for using microbial genome-sequence information to improve antimicrobial susceptibility testing.  
Tech: developed in Python and Gradle using bioinformatic software like GATK, SPAdes and BLAST.
- Algorithm Developer**      **Servizi di Organizzazione s.a.s. (IT)**      03 – 07/2017  
Development and optimisation of nesting algorithms. GUI and database integration.  
Tech: optimisation routine programmed in C, GUI developed in .Net and database built in SQLite.

## FOSS PROJECTS

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- LazyGrid**      <https://pypi.org/project/lazygrid>  
Development of Python package for scikit-learn pipelines' memoisation and comparison.  
Tech: Python, scikit-learn, joblib, TensorFlow, SQL, Git, Travis CI, Code Coverage, Read The Docs.
- Evolutionary core sets [7][9]**      <https://bitbucket.org/evomlteam/evolutionary-core-sets>  
Development of evolutionary-based algorithms to compress large data sets into few high-informative samples.  
Tech: Python, inspyred, scikit-learn, joblib, Git.
- GH-EXIN [10][12]**      <https://github.com/pietrobarbiero/ghexin>  
Design of novel neural networks for hierarchical and non-stationary clustering.  
Tech: MatLab, Python, NetworkX, scikit-learn, Git.

## SOFTWARE SKILLS

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Proficient: Python, Git, SQL Familiar: MatLab, Java, C, JavaScript, HTML/CSS, Bash, Assembly 8086

## LANGUAGES

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English: C1 Italian: native speaker

## AWARDS

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- Top Team Award at the European Innovation Academy 2019      07/2019
- Conference grant for DECON 2019 — International Conference on Decision Economics      06/2019
- Conference grant for WIRN 2018 — 28th Italian Workshop on Neural Networks      06/2018
- Conference grant for WIRN 2017 — 27th Italian Workshop on Neural Networks      06/2017

## Publications

Since 2017: 2 journals, 12 conference papers.

- [1] Pietro Barbiero et al. ‘DNA Microarray Classification: Evolutionary Optimization of Neural Network Hyperparameters’. In: *Neural Approaches to Dynamics of Signal Exchanges*. Springer, 2020, pp. 305–311. ISBN: 978-981-13-8949-8. DOI: [10.1007/978-981-13-8950-4\\_28](https://doi.org/10.1007/978-981-13-8950-4_28).
- [2] Pietro Barbiero et al. ‘Generating Neural Archetypes to Instruct Fast and Interpretable Decisions’. In: *Decision Economics: Complexity of Decisions and Decisions for Complexity*. Springer, 2020. DOI: [10.1007/978-3-030-38227-8\\_6](https://doi.org/10.1007/978-3-030-38227-8_6).
- [3] Pietro Barbiero et al. ‘Making Sense of Economics Datasets with Evolutionary Coresets’. In: *Decision Economics: Complexity of Decisions and Decisions for Complexity*. Springer, 2020. DOI: [10.1007/978-3-030-38227-8\\_19](https://doi.org/10.1007/978-3-030-38227-8_19).
- [4] Pietro Barbiero et al. ‘Neural Epistemology in Dynamical System Learning’. In: *Neural Approaches to Dynamics of Signal Exchanges*. Springer, 2020, pp. 213–221. ISBN: 978-981-13-8950-4. DOI: [10.1007/978-981-13-8950-4\\_20](https://doi.org/10.1007/978-981-13-8950-4_20).
- [5] Pietro Barbiero et al. ‘Understanding Cancer Phenomenon at Gene Expression Level by using a Shallow Neural Network Chain’. In: *Neural Approaches to Dynamics of Signal Exchanges*. Springer, 2020, pp. 281–290. ISBN: 978-981-13-8949-8. DOI: [10.1007/978-981-13-8950-4\\_26](https://doi.org/10.1007/978-981-13-8950-4_26).
- [6] Gabriele Ciravegna et al. ‘Assessing discriminating capability of geometrical descriptors for 3D face recognition by using the GH-EXIN neural network’. In: *Neural Approaches to Dynamics of Signal Exchanges*. Springer, 2020, pp. 223–233. ISBN: 978-981-13-8949-8. DOI: [10.1007/978-981-13-8950-4\\_21](https://doi.org/10.1007/978-981-13-8950-4_21).
- [7] Pietro Barbiero et al. ‘Beyond coreset discovery: evolutionary archetypes’. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM. 2019, pp. 47–48. ISBN: 978-1-4503-6748-6. DOI: [10.1145/3319619.3326789](https://doi.org/10.1145/3319619.3326789).
- [8] Pietro Barbiero et al. ‘Evolutionary discovery of coresets for classification’. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM. 2019, pp. 1747–1754. ISBN: 978-1-4503-6748-6. DOI: [10.1145/3319619.3326846](https://doi.org/10.1145/3319619.3326846).
- [9] Pietro Barbiero et al. ‘Fundamental Flowers: Evolutionary Discovery of Coresets for Classification’. In: *International Conference on the Applications of Evolutionary Computation (Part of EvoStar)*. Springer. 2019, pp. 550–564. ISBN: 978-3-030-16692-2. DOI: [10.1007/978-3-030-16692-2\\_37](https://doi.org/10.1007/978-3-030-16692-2_37).
- [10] Giansalvo Cirrincione et al. ‘The GH-EXIN Neural Network for Hierarchical Clustering’. In: *Neural Networks* 118.34 (2019). DOI: [10.1016/j.neunet.2019.07.018](https://doi.org/10.1016/j.neunet.2019.07.018).
- [11] Rita Berto et al. ‘An Individual’s Connection to Nature Can Affect Perceived Restorativeness of Natural Environments’. In: *Behavioral Sciences* 8.34 (2018). DOI: [10.3390/bs8030034](https://doi.org/10.3390/bs8030034).
- [12] Pietro Barbiero et al. ‘Neural Biclustering in Gene Expression Analysis’. In: *2017 International Conference on Computational Science and Computational Intelligence (CSCI)*. Vol. 11. 2017. ISBN: 978-1-5386-2652-8. DOI: [10.1109/csci.2017.361](https://doi.org/10.1109/csci.2017.361).
- [13] Pietro Barbiero et al. ‘Supervised gene identification in colorectal cancer’. In: *Quantifying and Processing Biomedical and Behavioral Signals*. Springer. 2017, pp. 243–251. ISBN: 9783319950945. DOI: [10.1007/978-3-319-95095-2\\_23](https://doi.org/10.1007/978-3-319-95095-2_23).
- [14] Pietro Barbiero et al. ‘Unsupervised Gene Identification in Colorectal Cancer’. In: *Quantifying and Processing Biomedical and Behavioral Signals*. 2017. ISBN: 9783319950945. DOI: [10.1007/978-3-319-95095-2\\_21](https://doi.org/10.1007/978-3-319-95095-2_21).