Alberto **Tonda**

Research Scientist · Evolutionary Computation · Machine Learning · Bioinformatics · Food Processing

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"And there may yet be a Heaven, but it's not going to be perfect, and we are going to have to build it ourselves."

Research Activities

My research interests lie at the intersection between computer science and life sciences. In the field of computer science, my activities focus on evolutionary algorihtms (EAs) and machine learning (ML). The main applications in life sciences are connected to bioinformatics for health sciences, and food transformation processes.

Improvement of EAs EAs are population-based stochastic optimization techniques, where a set of candidate solutions called *population* is maintained at every iteration. Preserving diversity in the population is commonly considered to be a key factor for the performance of EAs, but while evaluating diversity is straightforward for problems optimizing a vector of real values, it becomes much harder when the structure of a candidate solution is a binary tree, or a graph. I presented contributions on computing distances to evaluate diversity between complex candidate solutions [114, 121, 138], and published a review of diversity preservation methods for population-based optimization algorithms [40]. I also co-organized a tutorial and a workshop on diversity preservation in leading conferences of the field (ACM GECCO, IEEE CEC, PPSN). My other contributions to the field of EAs include devising a benchmark for cooperative coevolutionary algorithms [47, 127] and proposing solutions for the automated tuning of internal parameters [108].

Interpretability of ML models While generally effective, models obtained through ML are often black boxes, as it is practically impossible for humans to infer their decision processes, due to their sheer complexity. Some of my early works dealt with creating white-box, human-readable ML models such as systems of Ordinary Differential Equations (ODEs) [113], and integrating expert knowledge with data-driven models [111, 118, 122]. More recently I investigated the relationships between datasets characteristics and generalization abilities of models [150], and experimented with the translation of Explainable AI (XAI) techniques from the field of image analysis to genomic data [16]. Furthermore, I explored different approaches to feature and sample selection, the process of identifying the most compact sect of meaningful information to explain a ML algorithm decisions on a target problem [71, 72, 74, 76, 79, 80, 81]. As one of the leads in this research line includes combining EAs and ML, I am recognized as one of the experts of this niche, and as a consequence I co-organized tutorials on the subject in several specialized conferences (ACM GECCO, PPSN) plus an invited lecture in the summer school organized by COST Action CA15140 *Improving Applicability of Nature-Inspired Optimisation by Joining Theory and Practise*.

Bioinformatics In recent years, my research activities have branched to the application of ML and EAs to bioinformatics, thanks to a long-standing collaboration with the University of Utrecht (The Netherlands), with the recent addition of partners from the University of Cambridge (UK). The case studies I tackled include automatic discovery of micro-RNA signatures for tumors [26, 33, 82], batch correction of genomic datasets [77], and automatic primer design for viruses, with a focus on SARS-CoV-2 [16, 70]. Following these activities, I joined COST Action CA18131 *Statistical and Machine Learning Techniques in Human Microbiome Studies* (2019-2023), where I am currently one of the two representatives for France in the Management Committee.

Modeling of Food Transformation Processes Starting with my first post-doctoral position, I applied computational intelligence techniques to the field of food processing, a domain where the limited amount of data and the abundance of expert knowledge pose interesting challenges to ML and AI algorithms. This activity later became the main focus of my career as a permanent researcher at INRA/INRAE. The case studies I tackled, carried out mainly in the scope of the co-supervisions of PhD students Etienne Descamps and Thomas Chabin, include modeling diary emulsions [45, 104], freeze-drying of lactic acid bacteria [83, 87, 93],

biscuit cooking [85], cleaning processes of industrial machines [19, 29], behavior of the pepsin enzyme [36, 90, 105], ecosystem services [144]. I later chaired the European COST Action CA15118 *Mathematical and Computer Science Methods for Food Science and Industry* (2016-2020), a networking project that gathered experts from both academia and industry, to make a point on the state of the art and the possible future trajectories of the sector. The project led to several reviews and position papers [24, 28, 31, 75]. As an expert of the domain, I have been involved in several other internal INRAE activities that also led to position papers [22, 25, 32, 39, 143, 145], and I have provided my perspective in two invited talks at Académie de Technologies (Paris, France) and at the University of Sarajevo (Bosnia-Herzegovina).

AI in Games Since my Master, I developed an interest in AI applied to gaming. Games are an ideal benchmark for computational intelligence techniques, as creating an interesting opponent for humans requires software that is not only challenging, but also able to induce the tactics used by its adversaries. In this research line, I first worked on an AI able to model the opponent's behavior in the iterated Prisoner's Dilemma using EAs [42, 116], during my PhD co-supervision of Marco Gaudesi. I then tackled the automatic development of bots for the real-time strategy game StarCraft [110], submitting the first participant to the Student StarCraft AI Competition being entirely designed by another algorithm. A few years ago I started an ongoing project on developing competitive AIs for HearthStone, a collectible card game played online [18, 35, 103]. In the scope of these activities, since 2017 I have been co-chairing the session dedicated to games in the EvoSTAR conference.

Automated Support for Hardware and Software Several of my early research activities were centered around the development of automated techniques to support hardware testing, ranging from the generation of programs to test specific parts of the hardware [46, 48, 123, 125, 128, 130], to fail-test generation for complex CPUs [126, 131, 132, 136], to compensation of defects in electronic noses [49, 124, 133, 135]. In the domain of software, I applied the same ideas to software testing [50, 98, 137], analysis of network protocols [41, 44, 106, 115, 112, 119], and detection of malicious applications [30, 97, 109], with these last two activities carried out mainly in the scope of my co-supervision of PhD students Marco Gaudesi and Andrea Marcelli. More recently, I started the co-supervision of PhD student Eliana Giovannitti on the subject of automated discovery of backlash issues in industrial equipment [12, 69, 73].

Education

Université Paris-Saclay — *Paris, France*

Habilitation à Diriger des Recherches (HDR) in Computer Science (11/03/2022) — *Mar. 2022*

- French degree granting the holder the right of being the main supervisor of Ph.D. students.
- In order to obtain the degree, a considerable level of seniority in research has to be proven.
- Candidates are evaluated on publications, participation to projects, and joint co-supervision of Ph.D. students.
- Manuscript title: *Computational Intelligence Techniques for Food and Health Sciences*

Politecnico di Torino — *Torino, Italy*

Ph.D. in Computer Science and Engineering (11/04/2011) — *Jan. 2008 - Dec. 2010*

- Applications of evolutionary computation to games, hardware and software testing.
- 3 publications in international peer-reviewed journals.
- 14 publications in international peer-reviewed conferences.

Politecnico di Torino — *Torino, Italy*

M.S. in Computer Science and Engineering — *Jan. 2004 - Jan. 2007*

- Master thesis on automatic generation of artificial intelligence for boardgames (Quarto), using evolutionary computation.
- Magna cum laude. (110/110L)

Politecnico di Torino — *Torino, Italy*

B.S. in Computer Science and Engineering — *Sep. 2001 - Jan. 2004*

Experience

INRAE (National Research Institute for Agriculture, Food and the Environment) *Palaiseau, France*

Directeur de Recherche, 2ème Classe (DR2) / Senior Permanent Researcher *Jan. 2023 - Current*

- Employed in Joint Research Unit UMR 518 MIA-Paris (Mathématiques et Informatique Appliquées).
- Part of team EKINOCS (Expert Knowledge, INteractive modellINg and decisiOn makINg in dYNamic Complex Systems).
- Referent for the internal INRAE network on European projects, coordinating activities between the MathNum department and the JRU.

INRAE (National Research Institute for Agriculture, Food and the Environment) *Paris and Palaiseau, France*

Chargé de Recherche, Classe Normale (CRCN) / Permanent Researcher *Jan. 2020 - Dec. 2022*

- Employed in Joint Research Unit UMR 518 MIA-Paris (Mathématiques et Informatique Appliquées).
- Part of team EKINOCS (Expert Knowledge, INteractive modellINg and decisiOn makINg in dYNamic Complex Systems).
- Moved to a new JRU with all my previous team, due to the reorganization process of the new institute INRAE.
- Referent for the internal INRAE network on European projects, coordinating activities between the TRANSFORM department and the JRU.
- Participant to the committee for the definition of the scientific objectives of the INRA (who would then become INRAE) inter-department funding meta-programme on numeric agriculture (DigiGral).

INRA (National Research Institute for Agriculture) *Plaisir-Grignon, France*

Chargé de Recherche, 1ère Classe (CR1) / Classe Normale (CRCN) / Permanent Researcher *Jan. 2017 - Dec. 2019*

- Employed in Joint Research Unit UMR 782 GMPA (Génie et Microbiologie des Procédés Alimentaires).
- Co-leader of team MALICES (2019-2020).
- Referent for the internal INRA network on European projects, coordinating activities between the CEPIA department and the JRU.
- Coordinator of the Modeling group during the preparation of the roadmap document of the Joint Research Unit "SayFood" (UMR 782 and UMR 1145)
- After a positive evaluation, obtained the internal promotion from CR2 to CR1.

INRA (National Research Institute for Agriculture) *Plaisir-Grignon, France*

Chargé de Recherche, 2ème Classe (CR2) / Permanent Researcher *Sep. 2012 - Dec. 2016*

- Employed in Joint Research Unit UMR 782 GMPA (Génie et Microbiologie des Procédés Alimentaires).
- Part of team MALICES (Modélisation des Systèmes Alimentaires et Biologiques Complexes).
- Recruited in a position with job description "Knowledge engineering, modeling and analysis of complex food systems with a focus on reverse engineering and eco-design".

INRIA (National Research Institute for Computer Science and Automation) *Saclay, France*

Post-doctoral Researcher *July 2012 - August 2012*

- Employed in the ANR Project *EASEA-Cloud*
- Massive parallelization of evolutionary algorithms.
- Completed an efficient encoding of genetic programming trees, optimized for exchange of information over a network.

CNRS Institut des Systèmes Complexes (Complex Systems Institute) *Paris, France*

Post-doctoral Researcher *May 2011 - June 2012*

- Employed in the European FP7 project *DREAM*.
- Machine learning of food processing models, integrating human expertise.
- Developed innovative structure learning algorithms for Bayesian networks that are efficient even with limited datasets.

Politecnico di Torino *Torino, Italy*

Post-doctoral Researcher *Jan. 2011 - April 2011*

- Applications of evolutionary computation to games, hardware and software testing.

Bibliometrics

h-index	25 (Google Scholar), updated on December 12, 2024
i10-index	54 (Google Scholar), updated on December 12, 2024
Citations	2,114 (Google Scholar), updated on December 12, 2024
Publications	50 in peer-reviewed journals, 88 in peer-reviewed international conferences

Skills

Programming	Python, C/C++, Scala, JAVA
Stochastic Optimization	Evolutionary algorithms, Genetic programming
Machine Learning	Deep neural networks, Bayesian networks, Feature selection, Explainable AI
Languages	Italian (native), English (C2), French (B1)

Editorial Boards

2022-2023 **Editor**, Engineering Applications of Artificial Intelligence (ISSN 0952-1976) *Elsevier*
2020-2023 **Board member**, Frontiers in Sustainability (ISSN 2673-4524) *Frontiers*
2016- **Board member**, Genetic Programming and Evolvable Machines (ISSN 1573-7632) *Springer*

Program Committees (International Conferences)

ACM GECCO, Genetic and Evolutionary Computation Conference

Organizer of workshops, tutorials, proceedings chair, reviewer *2012 - 2022*

- Session chair for track Evolutionary Multiobjective Optimization (2022)
- Proceedings chair (2021)
- Co-organizer of the tutorial *Evolutionary Algorithms & Machine Learning, synergies and challenges* (2020)
- Co-organizer of the workshop on *Measuring and Promoting Diversity in Evolutionary computation* (2016)
- Co-organizer of the tutorial on *Measuring and Promoting Diversity in Evolutionary Algorithms* (2016)
- Reviewer (2012-2022)

IEEE CEC, Conference on Evolutionary Computation / IEEE WCCI

Organizer of tutorials, Reviewer *2014 - 2022*

- Co-organizer of tutorial *A Brief Introduction to Diversity-Preservation Methodologies in Evolutionary Optimization* (2014).
- Every two years, the IEEE CEC conference is co-hosted with the IEEE World Congress on Computational Intelligence (IEEE WCCI)
- Reviewer (2014-2022)

EvoSTAR, leading European conference on evolutionary computation

Organizer of tracks, reviewer *2012 - 2022*

- Co-organizer of the track on applications to Games (2017-2022)
- Reviewer (2012-2022)

Parallel Problem Solving from Nature, conference on bio-inspired optimization

Organizer of special tracks, reviewer *2016 - 2020*

- Co-organizer of the workshop on *Evolutionary Machine Learning* (2018)
- Co-organizer of the tutorial *A Brief Introduction of Diversity-Preservation Methodologies in Evolutionary Optimization* (2016)
- Reviewer (2016-2020)

FOODSIM, Biennial international conference on simulation in food science

Organizer of special sessions, reviewer *2018 - 2020*

- Organizer of the special session on COST Action CA15118 *FoodMC* (2020)
- Reviewer (2018-2020)

LOD International Conference on Machine Learning, Optimization, and Data

Reviewer *2022*

AAAI Conference on Artificial Intelligence

Reviewer *2021*

EA, biennial international conference on artificial evolution

Reviewer *2015 - 2021*

IEEE FRUCT, Finnish-Russian University Cooperation in Telecommunications

Reviewer *2020 - 2021*

ICORES, International Conf. on Operations Research and Enterprise Systems

Reviewer *2018 - 2020*

IMMM, International Conf. on Advances in Information Mining and Management

Reviewer *2015 - 2016*

Program Committees (National Events)

JET, Journée Evolutionnaire Thématique

Organizer *2015 - 2016*

- Annual seminar of the French association for artificial evolution.

Reviewing Activities

Ph.D. Defense Committees

External commission member *2019-2022*

- François Beaudeau, *Modeling Aromatic Synthesys During Wine Production*. Supervisors: César Arturo Aceves-Lara et Carine Bideaux, Institut National des Sciences Appliquées de Toulouse, France (2022)
- Anja Jankovic, *Towards Online Landscape-Aware Algorithm Selection in Numerical Black-Box Optimization*. Supervisor: Carola Doerr, Sorbonne University, France (2021)
- Denis Antipov, *Methods for Tight Analysis of Population-based Evolutionary Algorithms*. Supervisor: Benjamin Doerr, École Polytechnique, France (2020)
- Adrian Romero Caceres, *Evolutive Extraction of Parameter in Organic Thin-Film Transistor Compact Models*. Supervisors: J. G. Penalver and J. A. Jimenez Tejada, University of Granada, Spain (2019)
- Francesco Rossi, *Computer-Aided Technologies for Food Risk Assessment*. Supervisor: Alfredo Benso, Politecnico di Torino, Italy (2019)

Université Paris-Saclay

Reviewer of proposals for the UDOPIA call for PhD funding in Artificial Intelligence *2021*

The Cyprus Institute, Cyprus

Reviewer of project proposals for Production Access to HPC Resources *2021*

European Agency for COoperation in Science and Technology (COST)

Reviewer of project proposals *2019, 2022*

National Centre of Science and Technology Evaluation (NCSTE), Kazakhstan

Reviewer of project proposals *2018-2019*

Food Science Books Division, Elsevier

Reviewer of book proposals *2019*

International Peer-reviewed Journals

Reviewer of journal papers *2013-2020*

- Ad Hoc Networks, Elsevier, ISSN 1570-8705 (2014)
- Agriculture, MDPI, ISSN 2077-0472 (2016)
- Algorithms, MDPI, ISSN 1999-4893 (2013)
- Applied Sciences, MDPI, ISSN 2076-3417 (2020)
- Applied Soft Computing, Elsevier, ISSN 1568-4946 (2018)
- Artificial Intelligence in Medicine, Elsevier, ISSN 0933-3657 (2021)
- Automation in Construction, Elsevier, 0926-5805 (2018)
- Beverages, MPDI, ISSN 2079-7737 (2019)
- Biology, MDPI, ISSN 2079-7737, Special Issue on Developments in Bioinformatic Algorithms (2013)
- Cogent Engineering, Taylor & Francis, ISSN 2331-1916 (2021)
- Computational Intelligence, Wiley, ISSN 1467-8640 (2019)
- Computational Intelligence and Neuroscience, Hindawi, ISSN 1687-5265 (2015, 2016)
- Computer Networks, Elsevier, ISSN: 1389-1286 (2019)
- Entertainment Computing, Elsevier, ISSN 1875-9521 (2016)
- Evolutionary Intelligence, Springer, ISSN 1864-5909 (2018)
- Frontiers in Robotics and AI, Frontiers, ISSN 2296-9144 (2021)
- Future Generation Computer Systems, Elsevier, ISSN 0167-739X (2019)
- Genetic Programming and Evolvable Machines, Springer, ISSN 1389-2576 (2018, 2019, 2020)
- Genomics, Elsevier, ISSN 0888-7543 (2021)
- Global Environmental Change, Elsevier, ISSN 0959-3780 (2019, 2020)
- IEEE Access, ISSN 2169-3536, (2018, 2020, 2021)
- IEEE Transactions on Cybernetics, ISSN 2168-2267 (2018, 2020)
- IEEE Transactions on Evolutionary Computation, ISSN 1089778X (2017, 2018, 2019, 2020)
- Information Sciences, Elsevier, ISSN 0020-0255 (2017)
- International Journal of Swarm Intelligence and Evolutionary Computation, OMICS/Longdom, ISSN 2090-4908 (2014)
- International Journal of Business Intelligence and Data Mining, Inderscience, ISSN 1743-8187 (2020)
- ISA Transactions, Elsevier, ISSN 0019-0578 (2016)
- Journal of Cleaner Production, Elsevier, ISSN 0959-6526 (2014, 2015)
- Journal of Computational Science, Elsevier, ISSN 1877-7503 (2019)
- Journal of Food Engineering, Elsevier, ISSN 0260-8774 (2018, 2019, 2020)
- Journal of Food Process Engineering, Wiley, ISSN 1745-4530 (2018, 2019)
- Journal of Machine Learning Research, Microtome Publishing, ISSN 1532-4435 (2018)
- Journal of Systems Science and Complexity, ISSN 1009-6124, Special Issue on Complex Systems and Sports (2013)
- Mathematics, MDPI, ISSN 2227-7390 (2019)
- Methods and Protocols, MDPI, ISSN 2409-9279 (2020)
- Open Mathematics, De Gruyter, ISSN 2391-5455 (2018)
- Science Translational Medicine, AAAS, ISSN 1946-6242 (2020)
- Scientific Reports, Nature, ISSN 2045-2322 (2020)
- Soft Computing, Springer, ISSN 1432-7643 (2014, 2016)
- Swarm and Evolutionary Computation, Elsevier, ISSN 2210-6502 (2017, 2018)

Invited Contributions

2024	**Invited talk**, *System Identification with Genetic Programming*, at GPDA workshop	*Sydney, AU*
2022	**Invited talk**, *Feature Selection of Circulating miRNA for Cancer Classification*, at ENCALS conference	*Edinburgh, UK*
2021	**Invited talk**, *Emergence of Meaning in ML Embeddings*, at C. for Logic, Language, and Cognition	*Torino, Italy*
2020	**Invited lecture**, *Epistemology of Machine Learning*, at Friedrich-Alexander-Universität	*Erlangen, Germany*
2020	**Invited talk**, *Machine Learning in Food Transformation Processes*, at Académie de Technologies	*Paris, France*
2018	**Invited lecture**, *Epistemology of Machine Learning*, at Friedrich-Alexander-Universität	*Erlangen, Germany*
2018	**Invited talk**, *Machine Learning in the Food Sector*, at University of Sarajevo	*Sarajevo, BH*
2017	**Invited commentary**, *(Over-)Realism in Evolutionary Computation*, in journal GPEM [37]	*Springer*
2017	**Invited talk**, IOBC Conference on Integrated Protection of Stored Foods [92]	*Ljubljana, Slovenia*

Honors & Awards

2022	**2nd place**, GECCO Human-Competitive Awards, for [70, 148]	*Boston, US*
2020	**1st place**, Leaderboards for coreset discovery on 14 different datasets, with [149]	*Papers With Code*
2018	**2nd place**, HearthStone AI competition at the CIG Conference, with [18]	*Maastricht, NL*
2017	**Best paper award**, EvoSTAR conference, EvoApps track, for [91]	*Amsterdam, NL*
2014	**GENIL award**, Tied to the 2014 EvoSTAR best paper award	*Granada, Spain*
2014	**Best paper award**, EvoSTAR conference, for [113]	*Granada, Spain*
2012	**Honorable mention**, GECCO Human-Competitive Awards, for [132]	*Philadelphia, USA*
2011	**Finalist**, STARTENT Project, Future Entrepreneurs category	*Torino, Italy*

Projects and Funding

Mathematical and Computer Science Methods for Food Science and Industry (CA15118 FoodMC)

COST Action

Project Chair — *2016 - 2020*

- Duties included leading the project, coordinating activities, organizing meetings
- European networking project involving more than 50 researchers from over 30 countries
- The project led to several joint publications from participants. Among others: [24, 28, 31, 75, 88, 36]
- Funded by COST, European agency on cooperation in science and technology, total budget around 120k€/year

European Partnership on sustainable food systems for people, planet and climate (FutureFoodS)

Horizon Europe

Project Participant — *2024 - 2034*

- Funded by the Horizon Europe framework program on call HORIZON-CL6-2023-FARM2FORK-01-9, participant budget around 70k€

Pan-European Food Systems Science Network (FoSSNet)

Horizon Europe

Project Participant — *2024 - 2028*

- Funded by the Horizon Europe framework program on call HORIZON-CL6-2023-GOVERNANCE-01-04, participant budget around 100k€

Randomised Optimisation Algorithms Research Network (CA22137 ROAR-NET)

COST Action

Project Participant — *2024-2028*

- Involved in WG4, dealing with uncertainty in stochastic optimization

Sustainable Insect Chain (SUSINCHAIN)

H2020

Project Participant — *2019 - 2023*

- Involved in WP7, dealing with modeling and optimization of insect supply chains for food and feed
- Funded by the H2020 framework program on call LC-SFS-17-2019, participant budget around 100k€

Statistical and Machine Learning Techniques in Human Microbiome Studies (CA18131 ML4Microbiome)

COST Action

Management Committee Member — *2019-2023*

- One of the two MC Members representing France in the Action
- Involved in WG3, dealing with the standardization of ML techniques for genomic microbiome information

Artificial Metabolic Networks

ANR AAPG Project

Project Participant — *2022-2026*

- Project funded by the French National Agency for Research
- Includes funding for one Ph.D. student, of which I will be the main supervisor

Modélisation d'Accompagnement pour une Gestion Nouvelle et Intégrée des Fongicides et herbicides: Innovation, Conception collective et Exploration de Nouvelles Techniques (MAGNIFICENT7)

Meta-program SUMCROP, INRAE

Project Participant — *2020-2024*

- Involved in the development of a multi-agent system to simulate interactions between stakeholders
- Funded by inter-department meta-program SUMCROP, INRAE

TRAjectoires de transition VErtueuses pour la Réduction des usages des pesticides aSsociant les leviers Ecologiques, Economiques, Sociaux et institutionnels à l'échelle du territoire (TRAVERSéES)

Plan Ecophyto II, ANR

Project Participant — *2020-2022*

- Involved in the WP dealing with ecosystem modelling and interaction between stakeholders
- Funded by ANR call Ecopyhto II, for the reduction of pesticides in agriculture

Bien-Etre, Santé et SysTèmes d'Elevages (BEST)

Meta-program SANBA, INRAE

Project Participant — *2019-2023*

- Involved in the WP dealing with ecosystem modelling and interaction between stakeholders
- Funded by inter-department meta-program SANBA, INRAE

G-ENACTS, GEnomic aNalysis to ACcurately deTect SARS-CoV-2

SURFSara, The Netherlands

Project Participant — *2019*

- Involved in the WP for the automatic generation of primers for SARS-CoV-2, see [21]
- Total budget around 20k€, to be spent on up to 90,000 hours of cloud computation

PERFModel, Plate ExchangeR Fouling Model

TRANSFORM department, INRAE

Project Participant — *2018-2019*

- Involved in the machine learning of fouling models for plate exchangers in milk processing, see [19, 29]
- Funded by the INRAE TRANSFORM department, through an internal call for projects

AromOpti, Optimizing models for wine aromas

TRANSFORM department, INRAE

Project Participant — *2015-2016*

- Optimizing models for predicting aromatic qualities of wine
- Funded by the INRAE TRANSFORM department, through an internal call for projects

EvOxyde, Generating models for oxidation of meat

TRANSFORM department, INRAE

Project Participant — *2014-2015*

- Modelling meat oxidation using machine learning
- Funded by the INRAE TRANSFORM department, through an internal call for projects

Interactive Structure Learning for Models of Food Processes

TRANSFORM department, INRAE

Project Leader — *2013-2014*

- Devising new approaches for interactive machine learning applied to food processes, from limited datasets, see [111, 118]
- Funded by the INRAE TRANSFORM department, through an internal call for projects

Supervision Activities

PhD Students (8)

Irene Martinez-Menéndez

INSA Toulouse, France

Digital Twin for the Optimization of Bioprocesses — *2023-ongoing*

- Main supervision (40%), co-supervised with Dr. César Aceves-Lara (INSA Toulouse), Dr. Nadia Boukhelifa (INRAE)

Arthur Lequertier

ABIES, U. Paris-Saclay, France

Information Transmission through Dynamic Perturbations in Metabolic Networks — *2022-ongoing*

- Co-supervision (50%), with Dr. Wolfram Liebermeister (INRAE)

Bastien Mollet

STIC, Université Paris-Saclay, France

Machine Learning Models Translated to Metabolic Networks — *2022-ongoing*

- Main supervision (50%), co-supervised with Prof. Antoine Cornuéjols (AgroParisTech), Dr. Evelyne Lutton (INRAE)
- Joint publications: [151]

Eliana Giovannitti

SCU.DO., Politecnico di Torino, Italy

Computational Intelligence Techniques for Automatic Controls — *2018-2024*

- Shared main supervision (50%) with Prof. Giovanni Squillero
- Project extended due to the COVID situation and personal circumstances of the candidate; successfully defended
- Joint publications: [12, 69, 73]

Thomas Chabin

ABIES, AgroParisTech, France

Modélisation Interactive globale d'un Système de production de Micro-organismEs (MIME) — *2016-2019 (not defended)*

- Shared supervision (20%) with Dr. Nathalie Méjean-Perrot (INRAE) and Dr. Evelyne Lutton (INRAE), main supervisors
- Joint publications: [32, 83, 86, 87, 93, 94, 145]
- Currently employed as a Consultant at Astek, Boulogne-Billancourt, France

Etienne Descamps

ABIES, AgroParisTech, France

Approche de modélisation Monte-Carlo individu-centrée opérant par événements discrets, appliquée à un procédé d'homogénéisation d'une émulsion laitière — *2013-2016*

- Shared supervision (30%) with Dr. Nathalie Méjean-Perrot (INRAE) and Prof. Cristian Trelea (AgroParisTech), main supervisors
- Joint publications: [104]
- Currently employed as a Software Engineer at Numalis, Montpellier, France

Andrea Marcelli — *SCU.DO., Politecnico di Torino, Italy*

Machine Learning and other Computational-Intelligence Techniques for Security Applications — *2015-2018*

- Shared supervision (30%) with Prof. Giovanni Squillero, main supervisor
- Joint publications: [30, 84, 89, 91, 97, 109]
- Currently employed as a Malware Research Engineer at Talos-Cisco, Antibes, France

Marco Gaudesi — *SCU.DO., Politecnico di Torino, Italy*

Advanced Techniques for Solving Optimization Problems through Evolutionary Algorithms — *2012-2015*

- Shared supervision (30%) with Prof. Giovanni Squillero, main supervisor
- Joint publications: [42, 97, 108, 109, 112, 114, 116, 117, 120, 121, 123]
- Currently employed as a Senior Research Scientist at Nuance Communications, Torino, Italy

Master Students (18)

Stefano Griva — *Politecnico di Torino, Italy*

Application of Computational Intelligence Techniques to Collectible Card Games — *2023*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy.

Eugenio Dosualdo — *Politecnico di Torino, Italy*

Explainable Deep-learning Techniques for the Study of Antibiotic Resistance in Bacterial Infectants — *2022*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy, Dr. Giulio Ferrero, Università di Torino, Italy, and Pietro Barbiero, University of Cambridge, UK.

Jacopo Verducci — *Politecnico di Torino, Italy*

Drug Resistant Variants Detection Using an Evolutionary Algorithm Applied on Whole Genome Sequencing Data — *2022*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy, Dr. Giulio Ferrero, Università di Torino, Italy, and Pietro Barbiero, University of Cambridge, UK.

Taha Zafar — *Politecnico di Torino, Italy*

Unsupervised Conceptual Extraction in Deep Neural Networks — *2021*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy, and Pietro Barbiero, University of Cambridge, UK.

Sofia Borgato — *Politecnico di Torino, Italy*

Graph Neural Networks for the Analysis of Bacterial DNA — *2021*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy, Dr. Giulio Ferrero, Università di Torino, Italy, and Pietro Barbiero, University of Cambridge, UK.

Simone Alessandrì — *Politecnico di Torino, Italy*

Convolutional Neural Networks for the Analysis of Bacterial DNA — *2021*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino, Italy, Dr. Giulio Ferrero, Università di Torino, Italy, and Pietro Barbiero, University of Cambridge, UK.

Arthur Cahu — *École Polytechnique, France*

Deep Learning Techniques for the Analysis of Bacterial DNA — *2021*

Joao Henrique Oliveira — *École Polytechnique, France*

Machine Learning Extreme Values of Insect Infestations in Hop Fields — *2020*

Luca Barillari — *Politecnico di Torino, Italy*

Design and Development of a Python Package for a General-Purpose Evolutionary Algorithm — *2020*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino

Zi Wang — *Politecnico di Torino, Italy*

Machine Learning Extreme Values of Insect Infestations in Hop Fields — *2020*

- Co-supervised with Prof. Giovanni Squillero and Prof. Sandro Cumani, Politecnico di Torino

Pietro Barbiero — *Politecnico di Torino, Italy*

Novel Neural Techniques for Gene Expression Analysis in Cancer Prognosis — *2019*

- Co-supervised with Prof. Elio Piccolo, Politecnico di Torino
- Joint publications: [79, 82]

Hélène Ta — *AgroParisTech, France*

Mise en place d'une méthode d'optimisation automatique d'un réseau bayésien dynamique de prédiction de la maturation physico-chimique et sensorielle des baies de chenin vers une prédiction de la qualité du vin par logique flou — *2019*

- Co-supervised with Dr. Nathalie Méjean-Perrot, INRAE

Marcello Lanciani — *Politecnico di Torino, Italy*

Computational Intelligence Techniques for Cooperative Scenarios — *2019*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino

Nicolò Malfatto — *Politecnico di Torino, Italy*

Design and development of a portable, general-purpose evolutionary optimizer — *2018*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino

Benjamin Lemaitre — *Université de Caen, France*

Développement Python de fonctionnalités interactives pour un logiciel de recherche scientifique en modélisation semi-automatique — *2017*

- Co-supervised with Thomas Chabin, PhD student, INRAE

Alican Turk — *Politecnico di Torino, Italy*

Use of intelligent techniques for countering emerging malware in mobile devices — *2017*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino

Jany Belluz — *INP Ensimag, Grénoble, France*

Analyse et conception de méthodologies applicables sous forme d'algorithmes évolutionnistes pour le traitement de problèmes qui nécessitent un ensemble de solution homogènes — *2015*

- Co-supervised with Prof. Giovanni Squillero, Politecnico di Torino
- Joint publications: [108]

Thomas Chabin — *U. Pierre et Marie Curie, Paris, France*

Sensitivity analysis for evolutionary optimization of oxidative reactional systems — *2014*

- Co-supervised with Dr. Evelyne Lutton, INRAE
- Joint publications: [94, 107]

Post-doctoral Researchers (3)

Nisrine Mouhrim — *INRAE, France*

Project SUSINCHAIN — *2021-2022*

- Project funded by Horizon Europe
- Joint publications: [64, 65, 67]
- Currently working for Oderis Consulting, Paris

Yong Shi — *INRAE, France*

Project SURE-Farm — *2019-2020*

- Project funded by H2020 and convergence institute CLAND
- Co-supervised with Dr. Francesco Accatino, INRAE
- Joint publications: [6]
- Currently working for the School of Economics and Management, China University of Geosciences, China

Ilaria Brunetti — *INRAE, France*

Développement et transfert d'un outil d'aide à la décision appliqué à la maturation des baies de raisins rouge et blanc — *2018-2019*

- Project funded by the Compte d'affectation spéciale développement agricole et rural (CASDAR)
- Co-supervised with Dr. Nathalie Méjean-Perrot, INRAE and Daniel Pique, INRAE
- Joint publications: [14, 157]
- Currently working for the Niko Romito Group, Italy

Teaching

Deep learning in practice with pytorch — *U. Paris-Saclay, Saclay, France*

Organizer — *2023-*

- Deep learning architectures, from simple feed-forward to transformers
- Class for post-graduate (Ph.D.) students, 20-30 participants
- 30 hours

Optimization algorithms for artificial intelligence — *U. Paris-Saclay, Saclay, France*

Organizer — *2023-*

- Overview of optimization algorithms used for AI
- Class for post-graduate (Ph.D.) students, 20-30 participants
- 18 hours

Evolution Artificielle (Artificial Evolution) — *ENSTA ParisTech, Saclay, France*

Co-Organizer — *2018-2023*

- Introduction to evolutionary computation
- Class for undergraduate students (M1), 20-30 participants
- 18 hours

Nature-inspired search and optimisation heuristics — *Summer School, Coimbra, Portugal*

Invited Teacher — *Jul. 2019*

- Introduction to evolutionary machine learning
- Class for post-graduate (Ph.D.) students, 20-30 participants
- Invited by the networking project COST Action CA15140 ImAppNIO
- 6 hours

UC4, Quand la nature inspire les ingénieurs: algorithmes évolutionnaires, logique floue, neurones artificiels — *AgroParisTech, Paris, France*

Teacher Assistant — *2013-2016*

- Introduction to machine learning and optimization techniques
- Class for undergraduate students (M1), 20-30 participants
- 18 hours

Algoritmi e Programmazione Avanzata (Algorithms and Advanced Programming) — *Politecnico di Torino, Italy*

Teacher Assistant — *2009-2011*

- Introduction to advanced data structures in programming: binary trees, hash tables, ...
- Class for undergraduate students, 30-50 participants
- 24 hours

Fondamenti di Informatica (Fundamentals of Computer Science) — *Politecnico di Torino, Italy*

Teacher Assistant — *2008-2009*

- Introduction to basic concepts of programming and flow control
- Class for undergraduate students, 50-100 participants
- 24 hours

Participation to Start-Ups

2019	**Advisory board member,** Bactell, ML for prediction of antibiotics performance	*Wisconsin, US*
2016	**Co-founder,** Ominee, ML for employer-oriented online services	*Torino, Italy*

Press and Outreach

2021	**News,** on the work in cooperation with University of Utrecht: [Link]	*EConsulta, Mexico*
2021	**News,** on the work in cooperation with University of Utrecht: [Link]	*EDiary, India*
2021	**News,** on the work in cooperation with University of Utrecht: [Link]	*NRC, NL*
2021	**News,** on the work in cooperation with University of Utrecht: [Link]	*U.U. Website, NL*
2021	**News,** on the work in cooperation with University of Utrecht: [Link]	*EngineeringNet, BE*
2019	**News,** on the work in cooperation with Univ. of Granada and Univ. of Cadiz: [Link]	*TecnoXplora*
2018	**Interview,** by Bosnian TV Channel TVSA, for a meeting of the FoodMC project: [YouTube Video]	*TVSA, BH*
2014	**Divulgation article,** written with Dr. Lorenzo Menichetti, SWU, Uppsala, Sweden: [Link]	*Pedometron*

Publications in International Peer-reviewed Journals (50)

[1] David Rojas-Velazquez, Sarah Kidwai, Aletta D. Kraneveld, Alberto Tonda, Daniel Oberski, Johan Garssen, and Alejandro Lopez-Rincon. “Methodology for biomarker discovery with reproducibility in microbiome data using machine learning”. In: *BMC Bioinformatics* 25.1 (Jan. 2024). ISSN: 1471-2105.

[2] Niklas Jarmatz, Wolfgang Augustin, Stephan Scholl, Alberto Tonda, and Guillaume Delaplace. “Development of a soft sensor for fouling prediction in pipe fittings using the example of particulate deposition from suspension flow”. In: *Food and Bioproducts Processing* 145 (May 2024), pp. 116–127. ISSN: 0960-3085.

[3] Alberto Tonda, Christian Reynolds, and Rallou Thomopoulos. “An intercontinental machine learning analysis of factors explaining consumer awareness of food risk”. In: *Future Foods* 7 (2023), p. 100233. ISSN: 2666-8335.

[4] N. Mejean Perrot, Alice Roche, Alberto Tonda, Evelyne Lutton, and Thierry Thomas-Danguin. “Predicting odor profile of food from its chemical composition: Towards an approach based on artificial intelligence and flavorists expertise”. In: *Mathematical Biosciences and Engineering* 20.12 (2023), pp. 20528–20552. ISSN: 1551-0018.

[5] Jason Sicard, Sophie Barbe, Rachel Boutrou, Laurent Bouvier, Guillaume Delaplace, Gwenaëlle Lashermes, Laëtitia Théron, Olivier Vitrac, and Alberto Tonda. “A primer on predictive techniques for food and bioresources transformation processes”. In: *Journal of Food Process Engineering* (Mar. 2023).

[6] Yong Shi, Alberto Tonda, and Francesco Accatino. “Handling ecosystem service trade-offs: the importance of the spatial scale at which no-loss constraints are posed”. In: *Landscape Ecology* (Mar. 2023).

[7] Sergiy Smetana, Anita Bhatia, Uday Batta, Nisrine Mouhrim, and Alberto Tonda. “Environmental impact potential of insect production chains for food and feed in Europe”. In: *Animal Frontiers* 13.4 (Aug. 2023), pp. 112–120. ISSN: 2160-6056.

[8] Carmina Angelica Perez-Romero, Lucero Mendoza-Maldonado, Alberto Tonda, Etienne Coz, Patrick Tabeling, Jessica Vanhomwegen, John MacSharry, Joanna Szafran, Lucina Bobadilla-Morales, Alfredo Corona-Rivera, Eric Claassen, Johan Garssen, Aletta D. Kraneveld, and Alejandro Lopez-Rincon. “An Innovative AI-based primer design tool for precise and accurate detection of SARS-CoV-2 variants of concern”. In: *Scientific Reports* 13.1 (Sept. 2023).

[9] Georgios Papoutsoglou, Sonia Tarazona, Marta B. Lopes, Thomas Klammsteiner, Eliana Ibrahimi, Julia Eckenberger, Pierfrancesco Novielli, Alberto Tonda, Andrea Simeon, Rajesh Shigdel, Stéphane Béreux, Giacomo Vitali, Sabina Tangaro, Leo Lahti, Andriy Temko, Marcus J. Claesson, and Magali Berland. “Machine learning approaches in microbiome research: challenges and best practices”. In: *Frontiers in Microbiology* 14 (Sept. 2023).

[10] N. Mouhrim, D.A. Peguero, A. Green, B. Silva, A. Bhatia, D. Ristic, A. Tonda, A. Mathys, and S. Smetana. “Optimization models for sustainable insect production chains”. In: *Journal of Insects as Food and Feed* (Nov. 2023), pp. 1–19. ISSN: 2352-4588.

[11] Sarah Kidwai, Pietro Barbiero, Irma Meijerman, Alberto Tonda, Paula Perez-Pardo, Pietro Lio´, Anke H. van der Maitland-Zee, Daniel L. Oberski, Aletta D. Kraneveld, and Alejandro Lopez-Rincon. “A robust mRNA signature obtained via recursive ensemble feature selection predicts the responsiveness of omalizumab in moderate-to-severe asthma”. In: *Clinical and Translational Allergy* 13.11 (Nov. 2023). ISSN: 2045-7022.

[12] Eliana Giovannitti, Sayyidshahab Nabavi, Giovanni Squillero, and Alberto Tonda. “A Virtual Sensor for Backlash in Robotic Manipulators”. In: *Journal of Intelligent Manufacturing* (Apr. 2022).

[13] Antonio M. Mora, Alberto Tonda, Antonio J. Fernández-Ares, and Pablo García-Sánchez. “Looking for Archetypes: Applying Game Data Mining to Hearthstone Decks”. In: *Entertainment Computing* (May 2022), p. 100498. ISSN: 1875-9521.

[14] Nathalie Mejean Perrot, Alberto Tonda, Ilaria Brunetti, Hervé Guillemin, Bruno Perret, Etienne Goulet, Laurence Guerin, and Daniel Picque. “A Decision-Support System to Predict Grape Berry Quality and Wine Potential for a Chenin Vineyard”. In: *Computers and Electronics in Agriculture* 200 (Sept. 2022), p. 107167. ISSN: 0168-1699.

[15] Otilia Carvalho, Maria N. Charalambides, Ilija Djekić, Christos Athanassiou, Serafim Bakalis, Jose Benedito, Aurelien Briffaz, Cristina Castañé, Guy Della Valle, Isabel Maria Nunes de Sousa, Ferruh Erdogdu, Aberham Hailu Feyissa, Nickolas G. Kavallieratos, Alexandros Koulouris, Milica Pojić, Anabela Raymundo, Jordi Riudavets, Fabrizio Sarghini, Pasquale Trematerra, and Alberto Tonda. “Modelling Processes and Products in the Cereal Chain”. In: *Foods* 10.1 (Jan. 2021), p. 82.

[16] Alejandro Lopez-Rincon, Alberto Tonda, Lucero Mendoza-Maldonado, Daphne G. J. C. Mulders, Richard Molenkamp, Carmina A. Perez-Romero, Eric Claassen, Johan Garssen, and Aletta D. Kraneveld. “Classification and Specific Primer Design for Accurate Detection of SARS-CoV-2 Using Deep Learning”. In: *Scientific Reports* 11.1 (Jan. 2021).

[17] Giovanni Iacca, Kateryna Konotopska, Doina Bucur, and Alberto Tonda. “An Evolutionary Framework for Maximizing Influence Propagation in Social Networks”. In: *Software Impacts* (July 2021), p. 100107.

[18] Pablo García-Sánchez, Alberto Tonda, Antonio J. Fernández-Leiva, and Carlos Cotta. “Optimizing HearthStone Agents Using an Evolutionary Algorithm”. In: *Knowledge-Based Systems* 188 (Jan. 2020), p. 105032.

[19] Hannes Deponte, Alberto Tonda, Nathalie Gottschalk, Laurent Bouvier, Guillaume Delaplace, Wolfgang Augustin, and Stephan Scholl. “Two Complementary Methods for the Computational Modeling of Cleaning Processes in Food Industry”. In: *Computers & Chemical Engineering* 135 (Apr. 2020), p. 106733.

[20] Mourad Hannachi, Véronique Souchère, Samuel Buèche, Marc Dupayage, Bastien Boquet, J.-P. Pardoux, Elsa Berthet, Anne Deredec, Alberto Tonda, P. Pluquet, J.P. Leroy, Aurélie Albaut, Jacques Blarel, Jérôme Lecuyer, Claude Gazet, Muriel Leuba, Élodie Gagliardi, Karine Leleu, Philippe Leclercq, Émilien Quilliot, Jérôme Pernel, Marc Declemy, Bruno Chauvel, and Anne-Sophie Walker. “Vers une Action Collective à l’Échelle des Paysages”. In: *Phytoma. La Défense des Végétaux* 733 (Apr. 2020).

[21] Alejandro Lopez-Rincon, Lucero Mendoza-Maldonado, Marlet Martinez-Archundia, Alexander Schönhuth, Aletta D. Kraneveld, Johan Garssen, and Alberto Tonda. “Machine Learning-Based Ensemble Recursive Feature Selection of Circulating miRNAs for Cancer Tumor Classification”. In: *Cancers* 12.7 (July 2020), p. 1785.

[22] R. Thomopoulos, C. Baudrit, N. Boukhelifa, R. Boutrou, P. Buche, E. Guichard, V. Guillard, E. Lutton, P. S. Mirade, A. Ndiaye, N. Perrot, F. Taillandier, T. Thomas-Danguin, and A. Tonda. “Multi-Criteria Reverse Engineering for Food: Genesis and Ongoing Advances”. In: *Food Engineering Reviews* 11.1 (Jan. 2019), pp. 44–60.

[23] Francesco Accatino, Alberto Tonda, Camille Dross, François Léger, and Muriel Tichit. “Trade-offs and Synergies Between Livestock Production and Other Ecosystem Services”. In: *Agricultural Systems* 168 (Jan. 2019), pp. 58–72.

[24] Ilija Djekic, Milica Pojić, Alberto Tonda, Predrag Putnik, Danijela Bursać Kovačević, Anet Režek-Jambrak, and Igor Tomasevic. “Scientific Challenges in Performing Life-Cycle Assessment in the Food Supply Chain”. In: *Foods* 8.8 (Aug. 2019), p. 301.

[25] Geneviève Gésan-Guiziou, Aude Alaphilippe, Mathieu Andro, Joël Aubin, Christian Bockstaller, Raphaëlle Botreau, Patrice Buche, Catherine Collet, Nicole Darmon, Monique Delabuis, Agnès Girard, Régis Grateau, Kamal Kansou, Vincent Martinet, Jeanne-Marie Membré, Régis Sabbadin, Louis-Georges Soler, Marie Thiollet-Scholtus, Alberto Tonda, and Hayo Van-Der-Werf. “Annotation Data About Multi Criteria Assessment Methods Used in the Agri-food Research: The French National Institute for Agricultural Research (INRA) Experience”. In: *Data in Brief* 25 (Aug. 2019), p. 104204.

[26] Alejandro Lopez-Rincon, Marlet Martinez-Archundia, Gustavo U. Martinez-Ruiz, Alexander Schoenhuth, and Alberto Tonda. “Automatic Discovery of 100-miRNA Signature for Cancer Classification Using Ensemble Feature Selection”. In: *BMC Bioinformatics* 20.1 (Sept. 2019).

[27] Alberto Tonda. “Inspyred: Bio-inspired algorithms in Python”. In: *Genetic Programming and Evolvable Machines* 21.1-2 (Nov. 2019), pp. 269–272.

[28] Ilija Djekic, Alen Mujčinović, Aleksandra Nikolić, Anet Režek Jambrak, Photis Papademas, Aberham Hailu Feyissa, Kamal Kansou, Rallou Thomopoulos, Heiko Briesen, Nickolas G. Kavallieratos, Christos G. Athanassiou, Cristina L.M. Silva, Alexandrina Sirbu, Alexandru Mihnea Moisescu, Igor Tomasevic, Urška Vrabič Brodnjak, Maria Charalambides, and Alberto Tonda. “Cross-European Initial Survey on the Use of Mathematical Models in Food Industry”. In: *Journal of Food Engineering* 261 (Nov. 2019), pp. 109–116.

[29] Yingying Gu, Laurent Bouvier, Alberto Tonda, and Guillaume Delaplace. “A Mathematical Model for the Prediction of the Whey Protein Fouling Mass in a Pilot Scale Plate Heat Exchanger”. In: *Food Control* 106 (Dec. 2019), p. 106729.

[30] Andrea Atzeni, Fernando Diaz, Andrea Marcelli, Antonio Sanchez, Giovanni Squillero, and Alberto Tonda. “Countering Android Malware: A Scalable Semi-Supervised Approach for Family-Signature Generation”. In: *IEEE Access* 6 (2018), pp. 59540–59556.

[31] Ilija Djekic, Neus Sanjuán, Gabriela Clemente, Anet Režek Jambrak, Aleksandra Djukić-Vuković, Urška Vrabič Brodnjak, Eugen Pop, Rallou Thomopoulos, and Alberto Tonda. “Review on environmental models in the food chain - Current status and future perspectives”. In: *Journal of Cleaner Production* 176 (Mar. 2018), pp. 1012–1025.

[32] M. Barnabé, N. Blanc, T. Chabin, J.-Y. Delenne, A. Duri, X. Frank, V. Hugouvieux, E. Lutton, F. Mabille, S. Nezamabadi, N. Perrot, F. Radjai, T. Ruiz, and A. Tonda. “Multiscale modeling for bioresources and bioproducts”. In: *Innovative Food Science & Emerging Technologies* 46 (Apr. 2018), pp. 41–53.

[33] Alejandro Lopez-Rincon, Alberto Tonda, Mohamed Elati, Olivier Schwander, Benjamin Piwowarski, and Patrick Gallinari. “Evolutionary optimization of convolutional neural networks for cancer miRNA biomarkers classification”. In: *Applied Soft Computing* 65 (Apr. 2018), pp. 91–100.

[34] Peter Karpov, Giovanni Squillero, and Alberto Tonda. “VALIS: an Evolutionary Classification Algorithm”. In: *Genetic Programming and Evolvable Machines* 19.3 (Aug. 2018), pp. 453–471.

[35] Pablo García-Sánchez, Alberto Tonda, Antonio M. Mora, Giovanni Squillero, and Juan Julián Merelo. “Automated Playtesting in Collectible Card Games Using Evolutionary Algorithms: A Case Study in HearthStone”. In: *Knowledge-Based Systems* 153 (Aug. 2018), pp. 133–146.

[36] Alberto Tonda, Anita Grosvenor, Stefan Clerens, and Steven Le Feunteun. “In silico modeling of protein hydrolysis by endoproteases: a case study on pepsin digestion of bovine lactoferrin”. In: *Food & Function* 8.12 (2017), pp. 4404–4413.

[37] G. Squillero and A. Tonda. “(Over-)Realism in evolutionary computation: Commentary on “On the Mapping of Genotype to Phenotype in Evolutionary Algorithms” by Peter A. Whigham, Grant Dick, and James Maclaurin”. In: *Genetic Programming and Evolvable Machines* 18.3 (Feb. 2017), pp. 391–393.

[38] Daniele Versino, Alberto Tonda, and Curt A. Bronkhorst. “Data driven modeling of plastic deformation”. In: *Computer Methods in Applied Mechanics and Engineering* 318 (May 2017), pp. 981–1004.

[39] Nathalie Perrot, Hugo De Vries, Evelyne Lutton, Harald G.J. van Mil, Mechthild Donner, Alberto Tonda, Sophie Martin, Isabelle Alvarez, Paul Bourgine, Erik van der Linden, and Monique A.V. Axelos. “Some remarks on computational approaches towards sustainable complex agri-food systems”. In: *Trends in Food Science & Technology* 48 (Feb. 2016), pp. 88–101.

[40] Giovanni Squillero and Alberto Tonda. “Divergence of character and premature convergence: A survey of methodologies for promoting diversity in evolutionary optimization”. In: *Information Sciences* 329 (Feb. 2016), pp. 782–799.

[41] Doina Bucur, Giovanni Iacca, Marco Gaudesi, Giovanni Squillero, and Alberto Tonda. “Optimizing groups of colluding strong attackers in mobile urban communication networks with evolutionary algorithms”. In: *Applied Soft Computing* 40 (Mar. 2016), pp. 416–426.

[42] Marco Gaudesi, Elio Piccolo, Giovanni Squillero, and Alberto Tonda. “Exploiting Evolutionary Modeling to Prevail in Iterated Prisoner’s Dilemma Tournaments”. In: *IEEE Transactions on Computational Intelligence and AI in Games* 8.3 (Sept. 2016), pp. 288–300.

[43] Igor Deplano, Giovanni Squillero, and Alberto Tonda. “Anatomy of a portfolio optimizer under a limited budget constraint”. In: *Evolutionary Intelligence* 9.4 (Sept. 2016), pp. 125–136.

[44] Doina Bucur, Giovanni Iacca, Giovanni Squillero, and Alberto Tonda. “The impact of topology on energy consumption for collection tree protocols: An experimental assessment through evolutionary computation”. In: *Applied Soft Computing* 16 (Mar. 2014), pp. 210–222.

[45] Evelyne Lutton, Alberto Tonda, Sébastien Gaucel, Alain Riaublanc, and Nathalie Perrot. “Food model exploration through evolutionary optimisation coupled with visualisation: Application to the prediction of a milk gel structure”. In: *Innovative Food Science & Emerging Technologies* 25 (Oct. 2014), pp. 67–77.

[46] M. Grosso, W. J. Perez Holguin, E. Sanchez, M. Sonza Reorda, A. Tonda, and J. Velasco Medina. “Software-Based Testing for System Peripherals”. In: *Journal of Electronic Testing* 28.2 (Feb. 2012), pp. 189–200.

[47] Alberto Tonda, Evelyne Lutton, and Giovanni Squillero. “A benchmark for cooperative coevolution”. In: *Memetic Computing* 4.4 (Nov. 2012), pp. 263–277.

[48] Michelangelo Grosso, Wilson Javier Perez Holguin, Danilo Ravotto, Ernesto Sanchez, Matteo Sonza Reorda, Alberto Tonda, and Jaime Velasco Medina. “Functional Verification of DMA Controllers”. In: *Journal of Electronic Testing* 27.4 (Apr. 2011), pp. 505–516.
[49] S. Di Carlo, M. Falasconi, E. Sanchez, A. Scionti, G. Squillero, and A. Tonda. “Increasing pattern recognition accuracy for chemical sensing by evolutionary based drift compensation”. In: *Pattern Recognition Letters* 32.13 (Oct. 2011), pp. 1594–1603.
[50] Stefano Gandini, Walter Ruzzarin, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “A Framework for Automated Detection of Power-related Software Errors in Industrial Verification Processes”. In: *Journal of Electronic Testing* 26.6 (Nov. 2010), pp. 689–697.

Publications in International Peer-reviewed Conferences (88)

Several conferences managed by Springer (e.g. EvoSTAR, PPSN, EA) publish their peer-reviewed proceedings as book chapters, in series like Lecture Notes in Computer Science. Such publications are reported here, separately from those specifically redacted as book chapters, presented in the following sections.

[51] Andrea Calabrese, Stefano Quer, Giovanni Squillero, and Alberto Tonda. “Towards an Evolutionary Approach for Exploting Core Knowledge in Artificial Intelligence”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. GECCO ’24 Companion. Melbourne, VIC, Australia: Association for Computing Machinery, 2024, pp. 259–262. ISBN: 9798400704956.
[52] Mathilde Chen, David Makowski, and Alberto Tonda. “Multi-Objective Optimization for Large-scale Allocation of Soybean Crops”. In: *Proceedings of the Genetic and Evolutionary Computation Conference*. GECCO ’24. Melbourne, VIC, Australia: Association for Computing Machinery, 2024, pp. 1174–1182. ISBN: 9798400704949.
[53] Giovanni Squillero, Alberto Tonda, Dimitri Masetta, and Marco Sacchet. “Byron: A Fuzzer for Turing-complete Test Programs”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. GECCO ’24 Companion. Melbourne, VIC, Australia: Association for Computing Machinery, 2024, pp. 1691–1694. ISBN: 9798400704956.
[54] Francesco Giannini, Stefano Fioravanti, Pietro Barbiero, Alberto Tonda, Pietro Liò, and Elena Di Lavore. “Categorical Foundation of Explainable AI: A Unifying Theory”. In: *Explainable Artificial Intelligence*. Ed. by Luca Longo, Sebastian Lapuschkin, and Christin Seifert. Cham: Springer Nature Switzerland, 2024, pp. 185–206. ISBN: 978-3-031-63800-8.
[55] Y. Dianey Rueda-Arango, David Rojas-Velazquez, Aleksandra V. Gorelova, Johan Garssen, Alberto Tonda, and Alejandro Lopez-Rincon. “Image Generation with Interactive Evolutionary System using Bayesian Optimization”. In: *2024 16th International Conference on Human System Interaction (HSI)*. 2024, pp. 1–7.
[56] David Rojas-Velazquez, Sarah Kidwai, Luciënne de Vries, Péter Tözsér, Luis Oswaldo Valencia-Rosado, Johan Garssen, Alberto Tonda, and Alejandro Lopez-Rincon. “Machine-Learning Analysis of mRNA: An Application to Inflammatory Bowel Disease”. In: *2024 16th International Conference on Human System Interaction (HSI)*. 2024, pp. 1–7.
[57] Hengzhe Zhang, Qi Chen, Alberto Tonda, Bing Xue, Wolfgang Banzhaf, and Mengjie Zhang. “MAP-Elites with Cosine-Similarity for Evolutionary Ensemble Learning”. In: *Lecture Notes in Computer Science*. Springer Nature Switzerland, 2023, pp. 84–100.
[58] Soumita Das, Bijita Singha, Alberto Tonda, and Anupam Biswas. “Direct Comparative Analysis of Nature-Inspired Optimization Algorithms on Community Detection Problem in Social Networks”. In: *Mobile Computing and Sustainable Informatics*. Ed. by Subarna Shakya, George Papakostas, and Khaled A. Kamel. Singapore: Springer Nature Singapore, 2023, pp. 629–642. ISBN: 978-981-99-0835-6.
[59] David Rojas-Velazquez, Alberto Tonda, Itzel Rodriguez-Guerra, Aletta D. Kraneveld, and Alejandro Lopez-Rincon. “Multi-objective Evolutionary Discretization of Gene Expression Profiles: Application to COVID-19 Severity Prediction”. In: *Applications of Evolutionary Computation*. Ed. by João Correia, Stephen Smith, and Raneem Qaddoura. Cham: Springer Nature Switzerland, 2023, pp. 703–717. ISBN: 978-3-031-30229-9.
[60] Alberto Tonda, Isabelle Alvarez, Sophie Martin, Giovanni Squillero, and Evelyne Lutton. “Towards Evolutionary Control Laws for Viability Problems”. In: *Proceedings of the Genetic and Evolutionary*

Computation Conference. GECCO '23. Lisbon, Portugal: Association for Computing Machinery, 2023, pp. 1464–1472. ISBN: 9798400701191.

[61] Pietro Barbiero, Gabriele Ciravegna, Francesco Giannini, Mateo Espinosa Zarlenga, Lucie Charlotte Magister, Alberto Tonda, Pietro Lio, Frederic Precioso, Mateja Jamnik, and Giuseppe Marra. "Interpretable Neural-Symbolic Concept Reasoning". In: *Proceedings of the 40th International Conference on Machine Learning*. Ed. by Andreas Krause, Emma Brunskill, Kyunghyun Cho, Barbara Engelhardt, Sivan Sabato, and Jonathan Scarlett. Vol. 202. Proceedings of Machine Learning Research. PMLR, July 2023, pp. 1801–1825.

[62] Pietro Barbiero, Gabriele Ciravegna, Francesco Giannini, Mateo Espinosa Zarlenga, Lucie Charlotte Magister, Alberto Tonda, Pietro Lio, Frederic Precioso, Mateja Jamnik, and Giuseppe Marra. "Interpretable Neural-Symbolic Concept Reasoning". In: *Proceedings of the Proceedings of the 17th International Workshop on Neural-Symbolic Learning and Reasoning*. Ed. by Artur S. d'Avila Garcez, Tarek R. Besold, Marco Gori, and Ernesto Jiménez-Ruiz. Vol. 202. CEUR Workshop Proceedings. CEUR, July 2023, pp. 422–423.

[63] Alejandro Lopez-Rincon, David Rojas-Velazquez, Johan Garssen, Sander W. van der Laan, Daniel Oberski, and Alberto Tonda. "Bayesian Optimization for the Inverse Problem in Electrocardiography". In: *2023 IEEE Symposium Series on Computational Intelligence (SSCI)*. IEEE, Dec. 2023.

[64] Nisrine Mouhrim, Sergiy Smetana, Anita Bhatia, Alexander Mathys, Ashley Green, Daniela Peguero, and Alberto Tonda. "Towards Multi-Objective Optimization of Sustainable Insect Production Chains". In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. GECCO '22. Boston, Massachusetts: Association for Computing Machinery, 2022, pp. 352–355. ISBN: 9781450392686.

[65] Nisrine Mouhrim, Alberto Tonda, Itzel Rodríguez-Guerra, Aletta D. Kraneveld, and Alejandro Lopez Rincon. "An Evolutionary Approach to the Discretization of Gene Expression Profiles to Predict the Severity of COVID-19". In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. GECCO '22. Boston, Massachusetts: Association for Computing Machinery, 2022, pp. 731–734. ISBN: 9781450392686.

[66] Pietro Barbiero, Giovanni Squillero, and Alberto Tonda. "Predictable Features Elimination: An Unsupervised Approach to Feature Selection". In: *Machine Learning, Optimization, and Data Science*. Springer International Publishing, 2022, pp. 399–412.

[67] Alberto Tonda, Christian Reynolds, Nisrine Mouhrim, and Rallou Thomopoulos. "An Intercontinental Machine Learning Analysis of Factors Explaining Consumer Awareness About Food Risk". In: *Proceedings of FoodSIM 2022, 12th bi-annual International Conference on Modelling and Simulation in Food Engineering*. EUROSIS, Apr. 2022.

[68] Alejandro Lopez-Rincon, Daphne S. Roozendaal, Hilde M. Spierenburg, Asta L. Holm, Renee Metcalf, Paula Perez-Pardo, Aletta D. Kraneveld, and Alberto Tonda. "Modelling Asthma Patients' Responsiveness to Treatment Using Feature Selection and Evolutionary Computation". In: *Applications of Evolutionary Computation*. Springer International Publishing, 2021, pp. 359–372.

[69] Eliana Giovannitti, Sayyidshahab Nabavi, Giovanni Squillero, and Alberto Tonda. "Exploiting Artificial Swarms for the Virtual Measurement of Backlash in Industrial Robots". In: *2021 IEEE Congress on Evolutionary Computation (CEC)*. IEEE, June 2021.

[70] Alejandro Lopez Rincon, Carmina A. Perez Romero, Lucero Mendoza Maldonado, Eric Claassen, Johan Garssen, Aletta D. Kraneveld, and Alberto Tonda. "Design of specific primer sets for SARS-CoV-2 variants using evolutionary algorithms". In: *Proceedings of the Genetic and Evolutionary Computation Conference*. ACM, June 2021.

[71] Pietro Barbiero, Gabriele Ciravegna, Giansalvo Cirrincione, Alberto Tonda, and Giovanni Squillero. "Generating Neural Archetypes to Instruct Fast and Interpretable Decisions". In: *Advances in Intelligent Systems and Computing*. Springer International Publishing, 2020, pp. 45–52.

[72] Pietro Barbiero and Alberto Tonda. "Making Sense of Economics Datasets with Evolutionary Coresets". In: *Advances in Intelligent Systems and Computing*. Springer International Publishing, 2020, pp. 162–170.

[73] Eliana Giovannitti, Giovanni Squillero, and Alberto Tonda. "Virtual Measurement of the Backlash Gap in Industrial Manipulators". In: *Communications in Computer and Information Science*. Springer International Publishing, 2020, pp. 189–200.

[74] Pietro Barbiero, Evelyne Lutton, Giovanni Squillero, and Alberto Tonda. “A Novel Outlook on Feature Selection as a Multi-objective Problem”. In: *Lecture Notes in Computer Science*. Springer International Publishing, 2020, pp. 68–81.
[75] Ilija Djekic, Jan Van Impe, and Alberto Tonda. “Environmental Modelling in the Food Supply Chain - Future Perspectives”. In: *Proceedings of FoodSIM 2020, 11th bi-annual International Conference on Modelling and Simulation in Food Engineering*. 2020.
[76] Gabriele Ciravegna, Pietro Barbiero, Giansalvo Cirrincione, Giovanni Squillero, and Alberto Tonda. “Discovering Hierarchical Neural Archetype Sets”. In: *Progresses in Artificial Intelligence and Neural Systems*. Springer Singapore, July 2020, pp. 255–267.
[77] Alejandro Lopez Rincon, Aletta D. Kraneveld, and Alberto Tonda. “Batch correction of genomic data in chronic fatigue syndrome using CMA-ES”. In: *Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion*. ACM, July 2020.
[78] Giovanni Squillero and Alberto Tonda. “Evolutionary algorithms and machine learning”. In: *Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion*. ACM, July 2020.
[79] Pietro Barbiero and Alberto Tonda. “Fundamental Flowers: Evolutionary Discovery of Coresets for Classification”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2019, pp. 550–564.
[80] Pietro Barbiero, Giovanni Squillero, and Alberto Tonda. “Beyond coreset discovery”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM, July 2019.
[81] Pietro Barbiero, Giovanni Squillero, and Alberto Tonda. “Evolutionary discovery of coresets for classification”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM, July 2019.
[82] Pietro Barbiero, Andrea Bertotti, Gabriele Ciravegna, Giansalvo Cirrincione, Elio Piccolo, and Alberto Tonda. “Understanding Cancer Phenomenon at Gene Expression Level by using a Shallow Neural Network Chain”. In: *Neural Approaches to Dynamics of Signal Exchanges*. Springer Singapore, Sept. 2019, pp. 281–290.
[83] Thomas Chabin, Marc Barnabé, Nadia Boukhelifa, Fernanda Fonseca, Alberto Tonda, Hélène Velly, Benjamin Lemaitre, Nathalie Perrot, and Evelyne Lutton. “LIDeOGraM: An Interactive Evolutionary Modelling Tool”. In: *Lecture Notes in Computer Science*. Springer International Publishing, 2018, pp. 189–201.
[84] Doina Bucur, Giovanni Iacca, Andrea Marcelli, Giovanni Squillero, and Alberto Tonda. “Improving Multi-objective Evolutionary Influence Maximization in Social Networks”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2018, pp. 117–124.
[85] Alberto Tonda and Nathalie Méjean-Perrot. “A Long-Short-Term Memory Network Model for Biscuit Baking”. In: *Proceedings of FoodSIM 2018, 10th bi-annual International Conference on Modelling and Simulation in Food Engineering*. 2018. ISBN: 978-9492859-01-3.
[86] Nathalie Méjean-Perrot, Nadia Boukhelifa, Alberto Tonda, Thomas Chabin, Marc Barnabé, Dominique Swennen, Alice Roche, Thomas Thomas-Danguin, and Evelyne Lutton. “Human in the Loop for Modelling Food and Biological Systems: a Novel Perspective coupling Artificial Intelligence and Life Science”. In: *Proceedings of FoodSIM 2018, 10th bi-annual International Conference on Modelling and Simulation in Food Engineering*. 2018. ISBN: 978-9492859-01-3.
[87] Thomas Chabin, Marc Barnabé, Alberto Tonda, Nadia Boukhelifa, Fernanda Fonseca, Eric Dugat-Bony, Hélène Velly, Evelyne Lutton, and Nathalie Méjean-Perrot. “A Semi-automatic Modeling Approach for the Production and Freeze-drying of Lactic Acid Bacteria”. In: *Proceedings of FoodSIM 2018, 10th bi-annual International Conference on Modelling and Simulation in Food Engineering*. 2018. ISBN: 978-9492859-01-3.
[88] Alberto Tonda. “Building a Multidisciplinary Community on Mathematics and Computer Science for the Food Industry: The Case of FoodMC”. In: *Book of Abstracts of the 5th International ISEKI_Food Conference*. 2018. ISBN: 978-3-900932-57-2.
[89] Doina Bucur, Giovanni Iacca, Andrea Marcelli, Giovanni Squillero, and Alberto Tonda. “Evaluating surrogate models for multi-objective influence maximization in social networks”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM, July 2018.
[90] Alberto Tonda, Anita Grosvenor, Stefan Clerens, and Steven Le Feunteun. “In-silico Predictions of Pepsin-released Peptides”. In: *Proceedings of the International conference on Food Digestion 2017*. 2017.

[91] Doina Bucur, Giovanni Iacca, Andrea Marcelli, Giovanni Squillero, and Alberto Tonda. “Multi-objective Evolutionary Algorithms for Influence Maximization in Social Networks”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2017, pp. 221–233.
[92] Alberto Tonda. “FoodMC: a COST Action to Promote Modeling in Food Science and Industry”. In: *Proceedings of the IOBC conference on Integrated Protection of Stored Products*. 2017.
[93] Thomas Chabin, Marc Barnabé, Nadia Boukhelifa, Fernanda Fonseca, Alberto Tonda, Hélène Velly, Nathalie Méjean-Perrot, and Evelyne Lutton. “Interactive evolutionary modelling of living complex food systems”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. ACM, July 2017.
[94] Thomas Chabin, Alberto Tonda, and Evelyne Lutton. “How to Mislead an Evolutionary Algorithm Using Global Sensitivity Analysis”. In: *Lecture Notes in Computer Science*. Springer International Publishing, 2016, pp. 44–57.
[95] Nadia Boukhelifa, Anastasia Bezerianos, Alberto Tonda, and Evelyne Lutton. “Research Prospects in the Design and Evaluation of Interactive Evolutionary Systems for Art and Science”. In: *CHI workshop on Human Centred Machine Learning*. San Jose, United States, 2016.
[96] Igor Deplano, Giovanni Squillero, and Alberto Tonda. “Portfolio Optimization, a Decision-Support Methodology for Small Budgets”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2016, pp. 58–72.
[97] Marco Gaudesi, Andrea Marcelli, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Challenging Anti-virus Through Evolutionary Malware Obfuscation”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2016, pp. 149–162.
[98] Francesco Marino, Giovanni Squillero, and Alberto Tonda. “A General-Purpose Framework for Genetic Improvement”. In: *Parallel Problem Solving from Nature – PPSN XIV*. Springer International Publishing, 2016, pp. 345–352.
[99] Carola Doerr, Nicolas Bredeche, Enrique Alba, Thomas Bartz-Beielstein, Dimo Brockhoff, Benjamin Doerr, Gusz Eiben, Michael G. Epitropakis, Carlos M. Fonseca, Andreia Guerreiro, Evert Haasdijk, Jacqueline Heinerman, Julien Hubert, Per Kristian Lehre, Luigi Malagò, J. J. Merelo, Julian Miller, Boris Naujoks, Pietro Oliveto, Stjepan Picek, Nelishia Pillay, Mike Preuss, Patricia Ryser-Welch, Giovanni Squillero, Jörg Stork, Dirk Sudholt, Alberto Tonda, Darrell Whitley, and Martin Zaefferer. “Tutorials at PPSN 2016”. In: *Parallel Problem Solving from Nature – PPSN XIV*. Springer International Publishing, 2016, pp. 1012–1022.
[100] Juan J. Merelo, Federico Liberatore, Antonio Fernández Ares, Rubén García, Zeineb Chelly, Carlos Cotta, Nuria Rico, Antonio M. Mora, Pablo García-Sánchez, Alberto Tonda, Paloma de las Cuevas, and Pedro A. Castillo. “The Uncertainty Quandary: A Study in the Context of the Evolutionary Optimization in Games and Other Uncertain Environments”. In: *Transactions on Computational Collective Intelligence XXIV*. Springer Berlin Heidelberg, 2016, pp. 40–60.
[101] Alberto Tonda. “FoodMC: A European COST Action on Food Modelling”. In: *Proceedings of FoodSIM 2016, 9th bi-annual International Conference on Modelling and Simulation in Food Engineering*. Ghent, Belgium, Apr. 2016.
[102] Evelyne Lutton, Alberto Tonda, Nadia Boukhelifa, and Nathalie Perrot. “Complex systems in food science: Human factor issues”. In: *Proceedings of FoodSIM 2016, 9th bi-annual International Conference on Modelling and Simulation in Food Engineering*. Ghent, Belgium, Apr. 2016.
[103] Pablo Garcia-Sanchez, Alberto Tonda, Giovanni Squillero, Antonio Mora, and Juan J. Merelo. “Evolutionary deckbuilding in HearthStone”. In: *2016 IEEE Conference on Computational Intelligence and Games (CIG)*. IEEE, Sept. 2016.
[104] Etienne Descamps, Alberto Tonda, Sébastien Gaucel, Ioan Cristian Trelea, Evelyne Lutton, and Nathalie Méjean-Perrot. “Modeling Competition Phenomena in a Dairy Oil-in-water Emulsion Using Hybrid Kinetic Monte Carlo Simulations”. In: *Proceedings of the 6th International Symposium on Delivery of Functionality in Complex Food Systems 2015*. 2015.
[105] Anita Grosvenor, Alberto Tonda, Steven Le Feunteun, and Stefan Clerens. “In Vitro and In Silico Modelling of Protein Hydrolysis by Pepsin: A Case Study with Lactoferrin”. In: *Proceedings of the 3rd International Conference on Food Structures, Digestion & Health*. 2015.
[106] Doina Bucur, Giovanni Iacca, Giovanni Squillero, and Alberto Tonda. “Black Holes and Revelations: Using Evolutionary Algorithms to Uncover Vulnerabilities in Disruption-Tolerant Networks”. In: *Applications of Evolutionary Computation*. Springer International Publishing, 2015, pp. 29–41.

[107] Thomas Chabin, Alberto Tonda, and Evelyne Lutton. “Is Global Sensitivity Analysis Useful to Evolutionary Computation?” In: *Proceedings of the Companion Publication of the 2015 on Genetic and Evolutionary Computation Conference - GECCO Companion ’15*. ACM Press, 2015.
[108] Jany Belluz, Marco Gaudesi, Giovanni Squillero, and Alberto Tonda. “Operator Selection using Improved Dynamic Multi-Armed Bandit”. In: *Proceedings of the 2015 on Genetic and Evolutionary Computation Conference - GECCO ’15*. ACM Press, 2015.
[109] Marco Gaudesi, Andrea Marcelli, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Malware Obfuscation through Evolutionary Packers”. In: *Proceedings of the Companion Publication of the 2015 on Genetic and Evolutionary Computation Conference - GECCO Companion ’15*. ACM Press, 2015.
[110] Pablo Garcia-Sanchez, Alberto Tonda, Antonio M. Mora, Giovanni Squillero, and Juan J. Merelo. “Towards automatic StarCraft strategy generation using genetic programming”. In: *2015 IEEE Conference on Computational Intelligence and Games (CIG)*. IEEE, Aug. 2015.
[111] Alberto Tonda, Andre Spritzer, and Evelyne Lutton. “Balancing User Interaction and Control in BNSL”. In: *Lecture Notes in Computer Science*. Springer International Publishing, 2014, pp. 211–223.
[112] Andrea Cani, Marco Gaudesi, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Towards automated malware creation”. In: *Proceedings of the 29th Annual ACM Symposium on Applied Computing - SAC ’14*. ACM Press, 2014.
[113] Sébastien Gaucel, Maarten Keijzer, Evelyne Lutton, and Alberto Tonda. “Learning Dynamical Systems Using Standard Symbolic Regression”. In: *Lecture Notes in Computer Science*. Springer Berlin Heidelberg, 2014, pp. 25–36.
[114] Marco Gaudesi, Giovanni Squillero, and Alberto Tonda. “Universal information distance for genetic programming”. In: *Proceedings of the 2014 conference companion on Genetic and evolutionary computation companion - GECCO Comp ’14*. ACM Press, 2014.
[115] Doina Bucur, Giovanni Iacca, Giovanni Squillero, and Alberto Tonda. “The tradeoffs between data delivery ratio and energy costs in wireless sensor networks”. In: *Proceedings of the 2014 conference on Genetic and evolutionary computation - GECCO ’14*. ACM Press, 2014.
[116] Marco Gaudesi, Elio Piccolo, Giovanni Squillero, and Alberto Tonda. “TURAN: Evolving non-deterministic players for the iterated prisoner’s dilemma”. In: *2014 IEEE Congress on Evolutionary Computation (CEC)*. IEEE, July 2014.
[117] Marco Gaudesi, Andrea Marion, Tommaso Musner, Giovanni Squillero, and Alberto Tonda. “Evolutionary optimization of wetlands design”. In: *Proceedings of the 28th Annual ACM Symposium on Applied Computing - SAC ’13*. ACM Press, 2013.
[118] Alberto Tonda, Evelyne Lutton, Giovanni Squillero, and Pierre-Henri Wuillemin. “A Memetic Approach to Bayesian Network Structure Learning”. In: *Applications of Evolutionary Computation*. Springer Berlin Heidelberg, 2013, pp. 102–111.
[119] Doina Bucur, Giovanni Iacca, Giovanni Squillero, and Alberto Tonda. “An Evolutionary Framework for Routing Protocol Analysis in Wireless Sensor Networks”. In: *Applications of Evolutionary Computation*. Springer Berlin Heidelberg, 2013, pp. 1–11.
[120] Marco Gaudesi, Andrea Marion, Tommaso Musner, Giovanni Squillero, and Alberto Tonda. “An Evolutionary Approach to Wetlands Design”. In: *Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics*. Springer Berlin Heidelberg, 2013, pp. 177–187.
[121] Marco Gaudesi, Giovanni Squillero, and Alberto Tonda. “An efficient distance metric for linear genetic programming”. In: *Proceeding of the fifteenth annual conference on Genetic and evolutionary computation conference - GECCO ’13*. ACM Press, 2013.
[122] Alberto Paolo Tonda, Evelyne Lutton, Romain Reuillon, Giovanni Squillero, and Pierre-Henri Wuillemin. “Bayesian Network Structure Learning from Limited Datasets through Graph Evolution”. In: *Lecture Notes in Computer Science*. Springer Berlin Heidelberg, 2012, pp. 254–265.
[123] Lyl Mercedes Ciganda, Marco Gaudesi, Evelyne Lutton, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Automatic Generation of On-Line Test Programs through a Cooperation Scheme”. In: *2012 13th International Workshop on Microprocessor Test and Verification (MTV)*. IEEE, Dec. 2012.
[124] Stefano Di Carlo, Matteo Falasconi, Ernesto Sanchez, Giovanni Sberveglieri, Alberto Scionti, Giovanni Squillero, Alberto Tonda, and Perena Gouma. “Covariance Matrix Adaptation Evolutionary Strategy for Drift Correction of Electronic Nose Data”. In: *Proceedings of International Symposium on Olfaction and Electronic Nose 2011*. AIP, 2011.

[125] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Evolution of Test Programs Exploiting a FSM Processor Model”. In: *Applications of Evolutionary Computation*. Springer Berlin Heidelberg, 2011, pp. 162–171.
[126] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Evolutionary failing-test generation for modern microprocessors”. In: *Proceedings of the 13th annual conference companion on Genetic and evolutionary computation - GECCO ’11*. ACM Press, 2011.
[127] Alberto Tonda, Evelyne Lutton, and Giovanni Squillero. “Lamps: A Test Problem for Cooperative Coevolution”. In: *Nature Inspired Cooperative Strategies for Optimization (NICSO 2011)*. Springer Berlin Heidelberg, 2011, pp. 101–120.
[128] W. J. H. Perez, Ernesto Sanchez, Matteo Sonza Reorda, Alberto Tonda, and Juan Velasco Medina. “Functional Test Generation for the pLRU Replacement Mechanism of Embedded Cache Memories”. In: *2011 12th Latin American Test Workshop (LATW)*. IEEE, Mar. 2011.
[129] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Group evolution: Emerging synergy through a coordinated effort”. In: *2011 IEEE Congress of Evolutionary Computation (CEC)*. IEEE, June 2011.
[130] Ernesto Sanchez, Matteo Sonza Reorda, and Alberto Tonda. “On the functional test of Branch Prediction Units based on Branch History Table”. In: *2011 IEEE/IFIP 19th International Conference on VLSI and System-on-Chip*. IEEE, Oct. 2011.
[131] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Post-silicon failing-test generation through evolutionary computation”. In: *2011 IEEE/IFIP 19th International Conference on VLSI and System-on-Chip*. IEEE, Oct. 2011.
[132] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Automatic Generation of Software-based Functional Failing Test for Speed Debug and On-silicon Timing Verification”. In: *2011 12th International Workshop on Microprocessor Test and Verification*. IEEE, Dec. 2011.
[133] Stefano Di Carlo, Ernesto Sanchez, Alberto Scionti, Giovanni Squillero, Alberto Paolo Tonda, and Matteo Falasconi. “Towards drift correction in chemical sensors using an evolutionary strategy”. In: *Proceedings of the 12th annual conference on Genetic and evolutionary computation - GECCO ’10*. ACM Press, 2010.
[134] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Evolving Individual Behavior in a Multi-agent Traffic Simulator”. In: *Applications of Evolutionary Computation*. Springer Berlin Heidelberg, 2010, pp. 11–20.
[135] Stefano Di Carlo, Matteo Falasconi, Ernesto Sánchez, Alberto Scionti, Giovanni Squillero, and Alberto Tonda. “Exploiting Evolution for an Adaptive Drift-Robust Classifier in Chemical Sensing”. In: *Applications of Evolutionary Computation*. Springer Berlin Heidelberg, 2010, pp. 412–421.
[136] W. J. Perez H., Danilo Ravotto, Ernesto Sanchez, Matteo Sonza Reorda, and Alberto Tonda. “On the Generation of Functional Test Programs for the Cache Replacement Logic”. In: *2009 Asian Test Symposium*. IEEE, 2009.
[137] Sergio Gandini, Danilo Ravotto, Walter Ruzzarin, Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. “Automatic detection of software defects”. In: *Proceedings of the 11th Annual conference on Genetic and evolutionary computation - GECCO ’09*. ACM Press, 2009.
[138] Giovanni Squillero and Alberto Tonda. “A novel methodology for diversity preservation in evolutionary algorithms”. In: *Proceedings of the 2008 GECCO conference companion on Genetic and evolutionary computation - GECCO ’08*. ACM Press, 2008.

Books

[139] Anupam Biswas, Alberto Tonda, Ripon Patgiri, and Krishn Kumar Mishra, eds. *Applications of Nature-Inspired Computing and Optimization Techniques*. en. Elsevier, Apr. 2024.
[140] Evelyne Lutton, Nathalie Perrot, and Alberto Tonda. *Evolutionary Algorithms for Food Science and Technology*. Wiley, Nov. 2016.
[141] Ernesto Sanchez, Giovanni Squillero, and Alberto Tonda. *Industrial Applications of Evolutionary Algorithms*. Springer Berlin Heidelberg, 2012.

Book Chapters

[142] Anupam Biswas, Alberto Paolo Tonda, and Ripon Patgiri. “A brief introduction to nature-inspired computing, optimization, and applications”. In: *Applications of Nature-Inspired Computing and Optimization Techniques*. Elsevier, 2024, pp. 1–18. ISBN: 9780323957687.
[143] Rallou Thomopoulos, Nicolas Salliou, Patrick Taillandier, and Alberto Tonda. “Consumers’ Motivations towards Environment-Friendly Dietary Changes: An Assessment of Trends Related to the Consumption of Animal Products”. In: *Handbook of Climate Change Across the Food Supply Chain*. 2020.
[144] Francesco Accatino, Alberto Tonda, and Muriel Tichit. “Formaliser la Durabilité des Paysages Agricoles Comme un Problème Multi-objectif”. In: *Paysage, biodiversité fonctionnelle et santé des plantes, Ed. Quae, Ed. educagri*. 2019.
[145] Alberto Tonda, Nadia Boukhelifa, Thomas Chabin, Marc Barnabé, Benoît Génot, Evelyne Lutton, and Nathalie Perrot. “Interactive Machine Learning for Applications in Food Science”. In: *Human and Machine Learning*. Springer International Publishing, 2018, pp. 459–477.
[146] Ernesto Sanchez, Matteo Sonza Reorda, and Alberto Paolo Tonda. “On the Functional Test of Branch Prediction Units Based on the Branch History Table Architecture”. In: *VLSI-SoC: Advanced Research for Systems on Chip*. Springer Berlin Heidelberg, 2012, pp. 110–123.

Preprints

[147] Pierre Pica, Véronique Izard, Johan Rooryck, Alberto Tonda, Stanislas Dehaene, Elizabeth Spelke, and Jairo Saw. “Supplementary material for: Izard, Véronique, Pierre Pica & Elizabeth S. Spelke (2022) Visual Foundations of Euclidean Geometry. https://psyarxiv.com/rmdeh/”. In: (May 2022).
[148] Alejandro Lopez-Rincon, Carmina A. Perez-Romero, Alberto Tonda, Lucero Mendoza-Maldonado, Eric Claassen, Johan Garssen, and Aletta D. Kraneveld. *Design of Specific Primer Sets for the Detection of B.1.1.7, B.1.351, P.1, B.1.617.2 and B.1.1.519 Variants of SARS-CoV-2 using Artificial Intelligence*. 2021. bioRxiv: 2021.01.20.427043v2.
[149] Pietro Barbiero, Giovanni Squillero, and Alberto Tonda. *Uncovering Coresets for Classification With Multi-Objective Evolutionary Algorithms*. 2020. arXiv: 2002.08645 [cs.LG].
[150] Pietro Barbiero, Giovanni Squillero, and Alberto Tonda. *Modeling Generalization in Machine Learning: A Methodological and Computational Study*. 2020. arXiv: 2006.15680 [cs.LG].

Conference Abstracts

This section collects abstracts presented in conferences with no printed proceedings.

[151] Paul Ahavi, Bastien Mollet, Antoine Cornuejols, Audray Le Gouellec, Evelyne Lutton, Jean-Loup Faulon, and Alberto Tonda. “Escherichia coli-based Physical Reservoir Computing : Potential and Applications”. In: *Workshop on AI Methods and Models for (Bio)Catalysis and Synthetic Biology*. June 2024.
[152] Evelyne Lutton, Beichen Ji, Alberto Tonda, and François Boué. “Agent-based Modelling of Enzymatic Digestion Using Experimental Data”. In: *French Regional Conference on Complex Systems (FRCCS) 2022*. July 2022.
[153] Alberto Tonda, Ashley Green, Sayed Hossaini, Alexander Mathys, Daniela Peguero, and Sergeiy Smetana. “Multi-objective Optimization for Sustainable Insect Chains”. In: *EAAP Annual Meeting 2021*. 2021.
[154] Rallou Thomopoulos, Nicolas Salliou, Patrick Taillandier, and Alberto Tonda. “Assessing Trends on Consumption of Animal Products Through a Machine Learning Analysis of Consumer Motivations”. In: *Online Workshop on Computational Approaches in Eating Behavior Research*. 2021.
[155] Sergeiy Smetana, Alberto Tonda, and Alexander Mathys. “Modelling Approaches for Sustainable Insect Production Chains”. In: *EAAP Annual Meeting 2020*. 2020.
[156] Pablo Garcia-Sanchez, Antonio Fernandez-Ares, Alberto Tonda, and Antonio Mora. “Data Mining of Deck Archetypes in Hearthstone”. In: *Proceedings of CoSECiVi 2020, VI Congreso de la Sociedad Española para las Ciencias del Videojuego*. 2020.
[157] Ilaria Brunetti, Alberto Tonda, Daniel Picque, Lucia Guerin, and Nathalie Méjean-Perrot. “A Chenin Decision Help System to Predict Grape Berries Maturity and Anticipate Wine Potentialities”. In: *Chenin Blanc International Congress (CBIC)*. 2019.
[158] Pablo Garcia-Sanchez, Alberto Tonda, Antonio Fernandez-Leiva, Carlos Cotta, and M. Cobo Martin. “Optimización de agentes para HearthStone utilizando Algoritmos Evolutivos”. In: *4th Jornadas Andaluzas de Informatica*. 2019.

[159] Francesco Accatino, Delphine Neumeister, Wim Paas, Alberto Tonda, and Pytrik Reidsma. “The Adaptability of an Extensive Cattle Beef Farming System to Contrasted Societal Preferences - Coupling Multi-Objective Analysis and a Participatory Approach”. In: *European Association of Agricultural Economists (EAAE) Seminar*. 2019.

[160] Alberto Tonda. “Machine Learning in the Food Sector”. University of Sarajevo, Bosnia and Herzegovina. 2018.

[161] Evelyne Lutton, Alberto Tonda, Sebastien Gaucel, Alain Riaublanc, and Nathalie Perrot. “Food Model Exploration through Evolutionary Optimisation Coupled with Visualisation: Application to the Prediction of a Milk Gel Structure”. In: *Proceedings of the DREAM International Conference “From Model Foods to Food Model”*. 2013.

[162] Stefano Di Carlo, Matteo Falasconi, Ernesto Sanchez, Giorgio Sberviglieri, Alberto Scionti, Giovanni Squillero, and Alberto Tonda. “Artificial Olfaction: bio-inspired approaches for tackling sensor drift issue”. In: *Proceedings of the International Bionic Engineering Conference*. 2011.