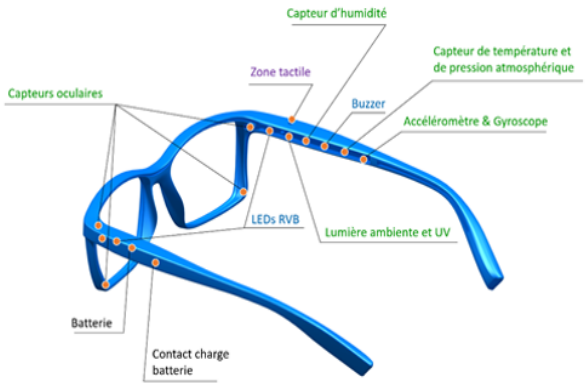
UNIVERSITÉ CÔTE D'AZUR
ACADEMY OF EXCELLENCE
NETWORKS, INFORMATION, AND DIGITAL SOCIETY

Structuring Programme
Digital Sciences, Society and Human



Project

ARTEFACT

extension of project **NeuComp**

LEAT — LABORATOIRE D'ELECTRONIQUE ANTENNES ET TELECOMMUNICATIONS

ellcie healthy

nively — locate what you value

A step forward in designing new software and hardware frameworks in neuroscience

NeuComp focused on the computational properties of the Leaky-Integrate-and-Fire (LIF) model. It set the ground for the ARTEFACT project which develops a prototype of neurobiohybride prothesis. Highly interdisciplinary, the project goes from the design of new devices to their implementation.

#neural networks #bio-inspired networks #IoT #miniaturization #AI #brain extension

Partners

> Benoît Miramond and Daniel Gaffé, Université Côte d'Azur, LEAT
> UCA laboratories: I3S, Inria, LJAD, MSHS, GREDEG, LAPCOS
> University of Tokyo
> Start-ups: Ellcie-Healthy and Nively

Duration

> NeuComp: Jan.-Dec 2017
> ARTEFACT: Oct. 18-Sept. 2021

Funding

227,7 k€

including DS4H and Academy 5 co-funding

Leverage Effect

> Ongoing: Industrial Patent
> Initiation of a collaboration with the University of Manchester on the topic of neural bio-inspired networks
> PhD grant for NeuComp trainee
> Invitation to present Neucomp project results to the community of HBP (Manchester, UK)

Publications & Conferences

> International Joint Conference on Neural Networks (IJCNN) 2018 : Lyes Khacef, Nassim Abderhamane, Benoît Miramond. Confronting machine-learning with neuroscience for neuromorphic architectures design.

> BIOINFORMATICS 2018, 9th International Conference on Bioinformatics Models, Methods and Algorithms, Funchal Madeira (Portugal): Elisabetta De Maria, Daniel Gaffé, Annie Ressouche, Cédric Girard Riboulleau, A Model-checking Approach to Reduce Spiking Neural Networks

> COMPAS 2017, Conférence d'informatique en Parallélisme, Architecture et Système, Sophia-Antipolis (France): Lyes Khacef and Benoît Miramond, Implémentation matérielle des réseaux de neurones artificiels : des Neurosciences au Machine Learning

> Rencontre C@UCA 2017, Fréjus (France): Alexandre Muzy, Iterative specification as a modeling and simulation formalism for I/O general systems: Application to neuronal spiking networks - Elisabetta De Maria, Modelling and Formal Verification of Neuronal Archetypes Coupling - Benoît Miramond, Neuromorphic architectures: a bridge between neurosciences and embedded artificial intelligence

> CSBio 2017 - 8th International Conference on Computational Systems-Biology and Bioinformatics, Nha Trang (Vietnam): Elisabetta De Maria, Thibaud L'Yvonnet, Daniel Gaffé, Annie Ressouche, Franck Grammont, Modelling and Formal Verification of Neuronal Archetypes Coupling, Proceedings pp.3-10

> HSB 2016 - 5th International Workshop Hybrid Systems Biology, Grenoble (France) Elisabetta De Maria, Alexandre Muzy, Daniel Gaffé, Annie Ressouche, Franck Grammont, Verification of Temporal Properties of Neuronal Archetypes Modeled as Synchronous Reactive Systems, Lecture Notes in Bioinformatics series pp.15