Organic neuromorphic electronics for emulating and interfacing biological systems

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Over millions of years of evolution Nature has found efficient solutions to given problems and specific needs. Although not always providing optimal solutions, Nature has definitely equipped living organisms with the ability to survive, evolve and thrive in a dynamic, unpredictable, antagonistic and at times hostile environment. Driven by the efficiency of biological systems, a sensible approach for the current high demand of integrating physically artificial forms of intelligence into everyday life, is the representation of the nervous system's functions with bio-mimetic or neuromorphic materials, electronics and systems. Current technologies of bioinspired and neuromorphic electronics still lack a universal framework for integration into everyday life. In this talk, it will be highlighted how organic neuromorphic electronics from based on organic mixed conductors can potentially enable the integration of diverse forms of intelligence everywhere. More specifically, organic neuromorphic electronics based on organic mixed conductors have the ability to emulate efficiently and with fidelity a wide range of bio-inspired functions including synaptic plasticity and neuronal dynamics. Practical demonstrations will also be shown, highlighting the potential of organic materials in robotics, sensing and neuromorphic bioelectronics.

References

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