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"My lab cross-fertilize concepts from neuroscience and bioengineering into computing to build intelligent neuroelectronics platforms to decode multiscale brain complexity and its fault-tolerance and concurrency features to help understand its function/dysfunction in physiological and pathological states."

Olfactory bulb CMOS-based biosensors

i.e., Brain-on-chip platform, Large-scale spatiotemporal circuit information, bioelectronics nose & AI, mapping multi-odor evoked responses

Computational Dynamics in Neurogenic Circuitry

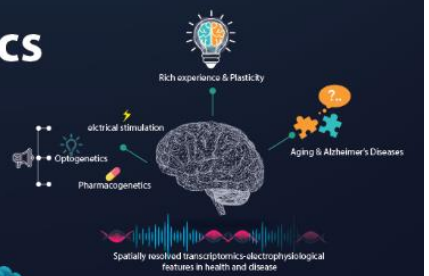
i.e., Network-wide mesoscopic Connectome, neural population coding, experience-dependent plasticity, novel therapies of Enviroceuticals

Bottom-up Computational Modeling

i.e., Data-driven feedforward & recurrent ANN, implementation of non-linear phase oscillators, testing for memory encoding and retrieval, neuromorphic computing

Linking Spatial Transcriptomics & Functional Dynamics

i.e., Mapping neural information from genes to network, multi-layer computational dynamics, AI-ML tools to predict novel smart biomarkers



Brain-machine Interface for Rewiring the Memory

i.e., Closed-loop bi-directional BMI of hippocamal circuit, neurogenic prosthetic framework, neuromorphic VLSI model