

**FREEDM Inventions and Patents
Calendar Year 2022**

Invention/Patent	ID	Title	FREEDM Inventors
Invention	2022-132	A Data-driven Probabilistic-based Flexibility Region Estimation Method for Aggregated Distributed Energy Resources	Ning Lu
Invention	2022-141	Heterogeneously Integrated UWBG and WBG HBTs	Spyridon Pavlidis
Invention	2022-145	Novel mesh-based architecture for DC microgrid control to achieve accurate current sharing among converters	Subhashish Bhattacharya
Invention	2022-193	Secure and Adaptive Multi-Timescale Framework for Resilient Energy Management of Community Microgrids with Dynamically Changing Boundaries	Mesut Baran, Ning Lu, Wenyuan Tang
Invention	2023-035	Adaptive Droop Control Incorporating Both SOC and SOH of Energy Storage Systems/Electric Vehicles in a DC Microgrid	Subhashish Bhattacharya
Invention	2023-046	An Air Gap-Integrated Capacitive Power Transfer System for Field Excitation of Wound Field Synchronous Machine	Iqbal Husain, Zeljko Pantic
Invention	2023-061	Solar Inverter With Multiple Dynamic Current Sources	Wensong Yu
Invention	2023-077	Multi-Level Isolated Power Converter and Control Method	Wensong Yu
Patent	11,239,717	AC Machine Windings	Iqbal Husain
Patent	11,276,779	Power MOSFET and JBSFET Cell Topologies with Superior High Frequency Figure of Merit	Jayant Baliga
Patent	11,356,015	Modular Medium Voltage Fast Chargers	Srdjan Lukic