GOVIND MITTAL

Energy Management | Grid Control | Microgrid
Battery Management | Energy Storage | Smart Power Converter

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PROFESSIONAL SUMMARY

Seasoned Electrical engineer with history of successfully designing and deploying best-in-class control systems designed for utility scale and C&I renewable energy projects (few hundred Kw to 679 MW) around the globe targeting to reduce customer's energy bill, generate revenue and stabilize grid.

SME on various energy storage technologies including Lithium-Ion & Hydrogen batteries, Flow Batteries, fly wheel storage etc.

EDUCATION

University of Houston – MS EE
Graduated in 2009 with focus on digital design.

RGPV University –
BE Instrumentation & Control
Graduated in 2006 with focus on control theory.

CORE COMPETENCIES

Controls of Energy Storage Technology (BESS)
(Lithium/Sodium/Hydrogen Battery/Flow Battery/Flywheel energy storage)

Energy Arbitrage | Peak Shave
Microgrids | PV Smoothening

Utility Scale Power Plant Controls
Volt/Q/PF regulation | Gen Controls
Freq response | Storage Controls
Cap Bank Controls

EMS | BMS | SCADA

Phase Balancing @ Data Centers

EXPERIENCE

Director, Control Systems — **April 2023 – Present**
EnerVenue

- ***Product owner*** of Energy Block Controller (EBC) for Nickel Hydrogen Battery.
  - Full ownership and hands on coding of EBC using IEC 61131 programming language (ST and FBD) which performs function of master Battery Management System (BMS) for large group of EnerVenue's nickel hydrogen battery racks (up to 9 MWhr) which can be duplicated for multi mega watt hour deployments.
  - Full ownership of Energy Management System (**EMS**) implemented within EBC tailored to optimize system operation for energy savings applications for C&I scale customers.
  - Selected off the shelf Programmable Logic Controller (**PLC**) to run the EBC/EMS code.
  - Successfully achieved ***SunSpec*** Modbus certification of EBC in January 2025 for model 1, 802, 803. Link here
  - Designed a panel for EBC with back up power, integrated managed switch and remote access gateway.

- Leading a team which is developing firmware for advanced battery management system (**BMS**) for Nickel Hydrogen Battery.
  - Leading a team of firmware and modeling engineers to design state-of-the-art BMS from ground up.
  - Along with all the safety and monitoring features, the BMS also performs predictive analytics for maintenance and battery cell/vessel balancing logic. The BMS also supports battery charging from a complete dead state without requiring an external charger.
  - Supporting UL 991, UL1998 and UL9540 certification process as it applies to firmware aspect of the BMS.

- Supporting both product engineering and manufacturing groups by providing products, guidance and consulting advice.
  - Co-developed innovative battery activation controller and process to significantly reduce the overall battery cost and streamline manufacturing operations. ***Patent*** has been filed Aug 2024.
  - Designed a controller for test engineering group to test EnerVenue's batteries using traditional battery cyclers and inverters for performance characterization.

Director, Grid Edge Software **Feb 2020 – March 2023**
CE+T America

- ***Product owner*** of Microgrid Controls and Power Management System (**PMS**)
  - Full ownership of the design and development (from ground up) of PMS from coding to panel design, documentation and setting a sales price for the product. Selected an off the shelf controller (PLC) and developed in house code to run on the controller to execute various energy savings and back up (microgrid) tasks for systems up to 500 kw. Main control features developed includes peak shaving, load shedding, energy arbitrage, solar smoothening, microgrid etc. The company is still selling this product today! **See here for a press release.**
  - Selected right battery vendors to pair with PMS and CE+T power converters. Negotiated pricing agreements as well.
  - Developed software to automate "electrolyte cleaning" process for flow batteries eliminating the need for a truck roll/manual intervention which is required every 2 to 4 weeks resulting in significant operational cost savings and system reliability.
  - Developed software to control flywheel energy storage system including the flywheel startup routine.
  - Developed software to support a ***DC microgrid*** (380 Volts DC) for a leading Lighting supplier in the US' east coast.
  - Developed software to sustain DC bus supporting ***hydrogen electrolysis*** for a research lab in the US' west coast.
  - Developed additional custom code within PMS for ***mobile power applications*** for customers in Canada and US.

- ***Product owner*** of Battery Combiner and Islanding Switchgear (240 kw)
  - Full ownership of the design of a battery combiner box capable of accepting 6 battery strings and 6 PCS and single handedly lead the efforts and achieved UL 1741 certification of the product. Link here
  - Designed Islanding switchgear capable of performing seamless grid to back up to grid transition using CE+T's Stabiliti power inverters. Link here

Achievements

- Developed commercially ***sellable products*** targeted for commercial and industrial renewable energy market from scratch.
- Designed highly energy efficient phase balancing control algorithm for ***Data Centers.***
- Streamlined the battery sourcing supply chain by bringing cost and lead times significantly down

Manager, Grid Controls **July 2012 – Feb 2020**
SunPower Corp

- ***Product owner*** of SunPower Grid Controller (SGC) product for utility scale solar power plants.
  Co- owner of SunPower Grid Controller which is a plant controller designed for utility scale solar + storage power plants. Developed control logic such as real power/generation control/curtailment, non-export/min import, solar smoothening, reactive power control, PF regulation, voltage regulation etc on high voltage transmission systems ranging from 12.5 kV to 235 Kv. Logic was developed to comply with various grid codes around the world including US, South Africa, Chile, Vietnam and Australia.
  - Some of the control algorithms I developed were logged as ***Trade Secret***, later to be used for ***patent filing***. Link here.
  - Co-ownership of hands-on coding of SGC to enable power plant's compliance with local grid standards while maximizing power generation and elongating equipment life.
  - Used ***Schneider Electric PLCs*** (Modicon & Quantum) to implement SGC. SGC communicates with all field devices including PV/BESS inverters, capacitor bank and meters over ***Modbus TCP*** and performs sub second calculations for determining the correct setpoints/commands to maintain P/Q/PF/F at POI.
  - Performed vendor qualification for all the solar and storage systems employed at SunPower's projects. This includes designing technical requirement documentation and performing in depth factory and site acceptance tests.
  - Perform Controls & Automation Factory Testing (***FAT***) on Capacitor Banks, Energy Storage, Battery Banks
  - Performed on site commissioning.

- ***Product owner*** of Capacitor Bank Controller, Energy Storage Controller and Solar Tracker Controller
  - Single handedly designed in house controller for capacitor banks eliminating SunPower's reliance on GE and NEPSI.
  - Designed solar panel tracker controller for one of the world's largest utility power plant of its time (650 MW) aimed at stowing and unstowing tracker using unique algorithm to maximize generation while emphasizing system safety.
  - Designed Energy Storage Controller or an EMS for various applications.

- Trained Senior SCADA Engineers, Commissioning Managers & Operation Managers on Grid Controllers
  - Developed professional technical documentation and training material published on SunPower's university.
  - Played an instrumental part of SunPower's Remote Operations and Control Center (ROCC) by training and guiding ROCC operators to ensure they are trained to make control mode and setpoint changes as requested by transmission operators.
  - Created various training materials and technical notes to help ROCC engineers get better at managing power plants.

Achievements

- ***Won "Innovate Relentlessly" PRISM Award*** for designing energy storage controller for flow batteries.
- ***Won "Bright Spot" Award*** for creating a software and a framework within excel to automate tracking BESS (Energy storage system) warranty. The framework helped recoup $26000 for a single project for 1 year alone.
- Submitted ***three invention*** disclosure forms for control scheme development for patent approval**.**

Key Projects

- "Microgrid Project utilizing 28 MW PV, storage, DERMs controls (SDG&E, NREL, Spirea & NRG)
- Half a dozen military projects – Vandenburg AFB, Redstone Arsenal, Nellis AFB, China lake etc.
- Apple Projects – Bonney Brooke, Claremont, Conover and apple campus.

Electrical Engineering PM **Aug 2010 – July 2012**
WindTronics

- *Product owner* of smart box (wind turbine controller – using C language, Texas Instrument's DSP)

Achievements

- Tripled power extraction of 1.5 kilo watt wind turbine controller through firmware modification
- Modified firmware and circuits of WindTronics' SmartBox Wind Turbine Controller resulting in battery power savings of thirty percent