Docket #: S12-374

Power electronics system that harvests excess power from unbalanced photovoltaic modules to boost overall efficiency

Stanford researchers have developed an efficient and low-cost device which increases the energy harvest of a system by recovering these losses through module-level maximum power point tracking (MPPT). Through a new circuit architecture which diverts mismatched power rather than the entire panel power, this device efficiently boosts power output from solar modules while utilizing low-cost, low-power components. This design has the potential to allow developers of large-scale solar systems to utilize land more effectively and decrease maintenance costs.

Figure

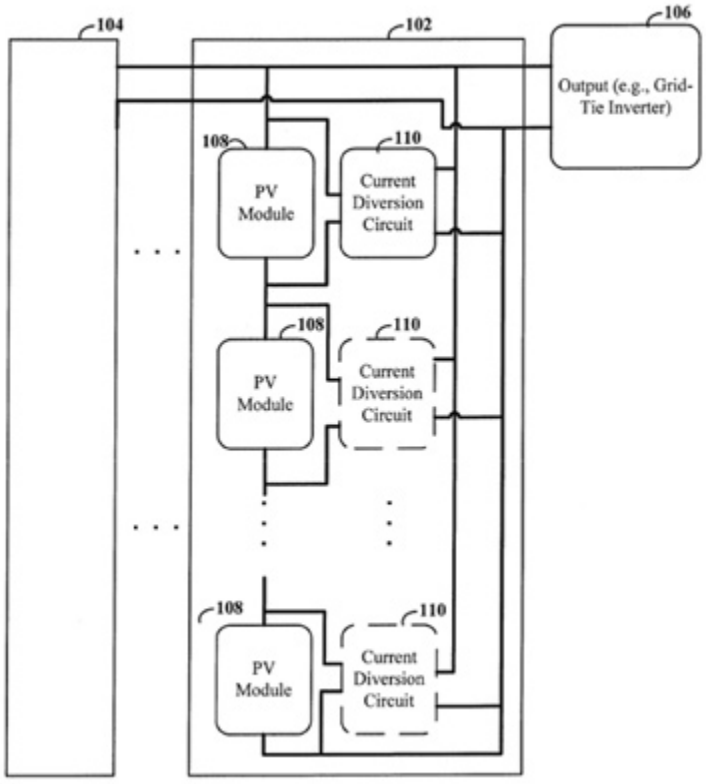


Figure description: System architecture

Stage of Research:
First iteration prototype has been built to demonstrate the feasibility of this MPPT circuit and software algorithm

Related Technolgies from The Dally Lab:

Stanford Docket S14-246 "Probabilistic Cache Replacement to Reduce Cache Misses"

Stanford Docket S12-138 "High-Radix Interprocessor Communications System and Method"

Stanford Docket S11-305 "Speculative Reservation Protocol"

Stanford Docket S07-039 "Flattened Butterfly: Cost-efficient High-Radix Topology"

Stanford Docket S07-359 "Technology-Driven, Highly-Scalable Dragonfly Topology"

Applications

- Utility and commercial PV installations

- Residential PV installations

Advantages

- Optimizes performance of power panels
- Higher efficiency
- Higher tolerance for device failure
- Monitoring capability
- Utilizes land more effectively
- Reduces bill of materials cost
- Decreases maintenance cost

Patents

- Published Application: 2014-265589
- Published Application: WO2014151843

Innovators

- William Dally
- Darren Hau
- Vivek Choksi
- Andrew Ponec
- Christopher Ling

Licensing Contact

Mona Wan

Senior Licensing Manager for Special Projects

Email