



Empowering Students with Interdisciplinary Hands-On Experience for Renewable Energy

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PRESENTED AT



INTRODUCTION:

The development of an interdisciplinary platform is presented with the objective of lowering the educational barriers that emerge when going from textbook knowledge, to simulations, and to experiments. The portable and robust educational platform proposed, a Sustainable, Portable, Efficient, Electricity, Delivery (SPEED) system, will empower next generation engineers to gain hands-on experience in the areas of control, power electronics, electrical and mechanical design. Our goal is to maximize the learning efficiency, reduce barriers of practical experience, and motivate students to pursue a career on renewable energy.



CONTROL STRATEGIES:

The SYNDEM kit is configured as a DC/DC/AC converter with the Maximum Power Point Tracking (MPPT) algorithm in Fig. 1 and the robust droop control algorithm in Fig. 2 implemented.

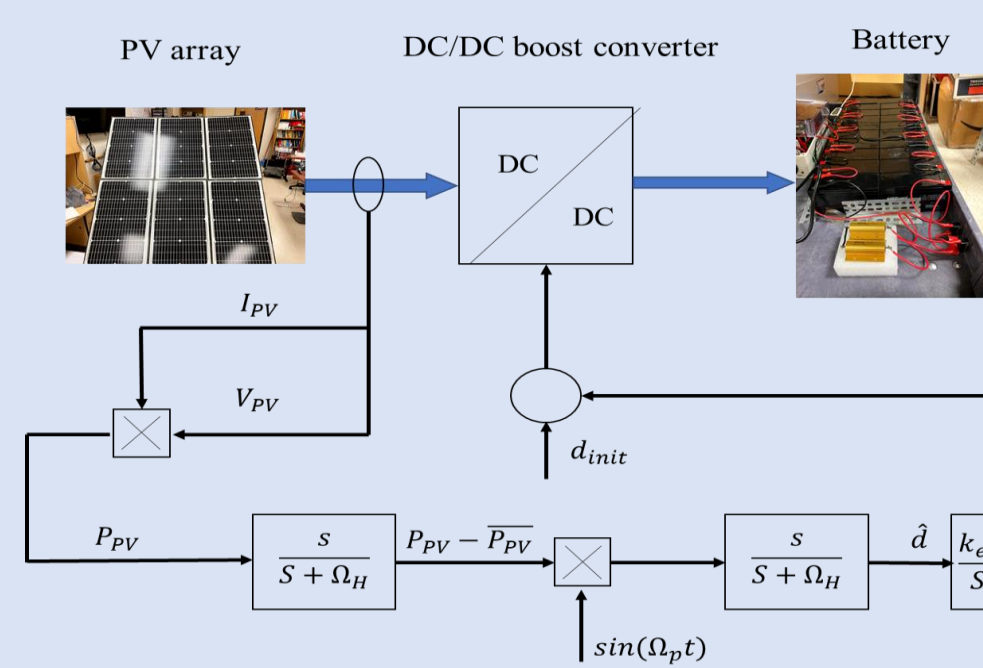


Fig. 1 MPPT algorithm

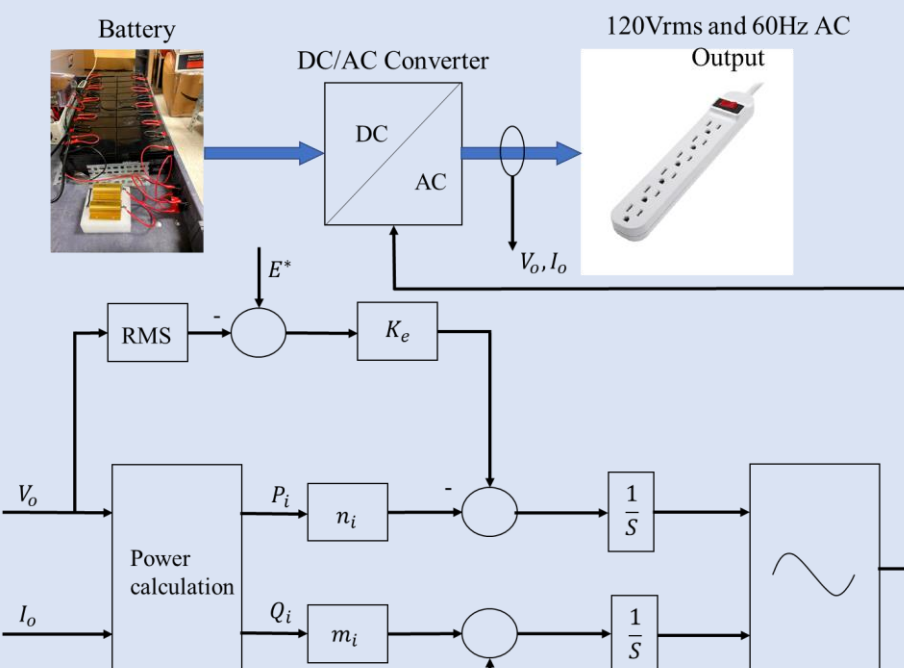
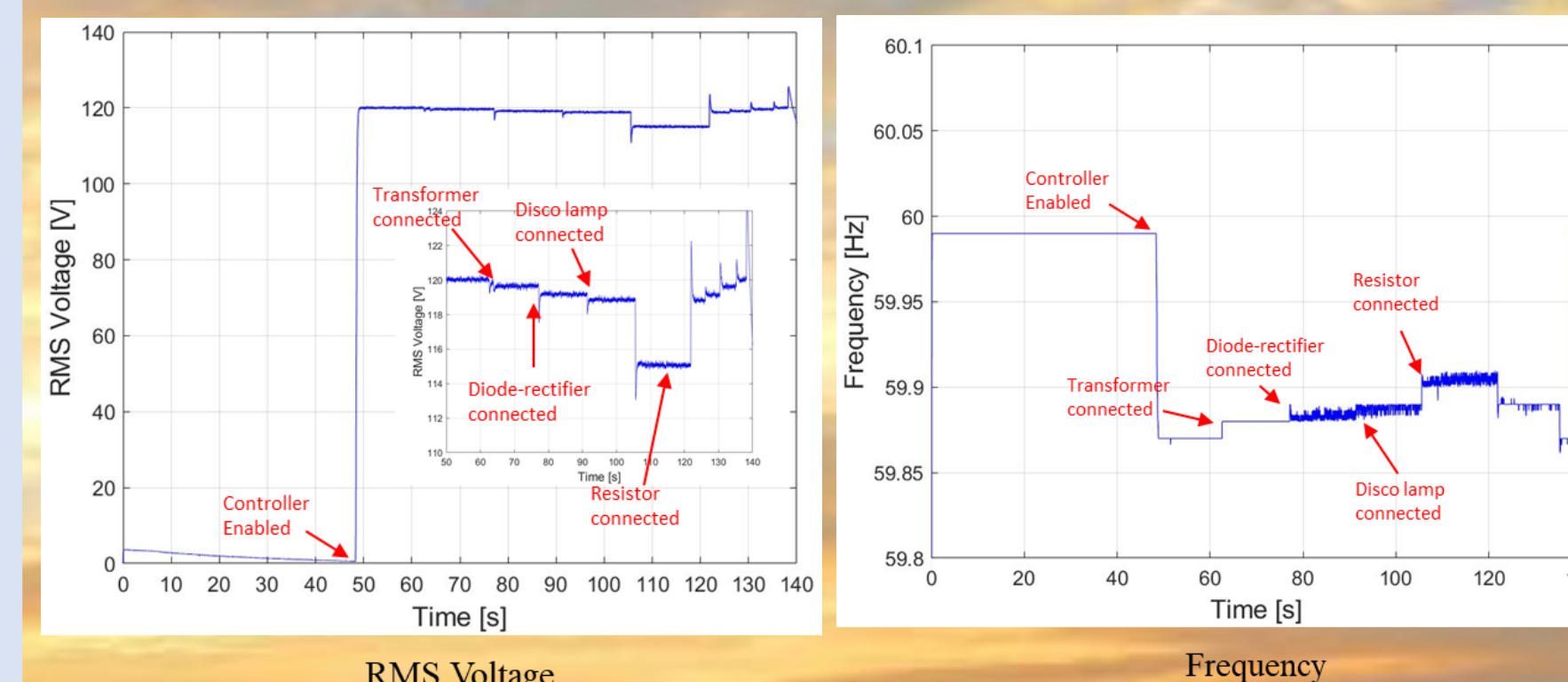
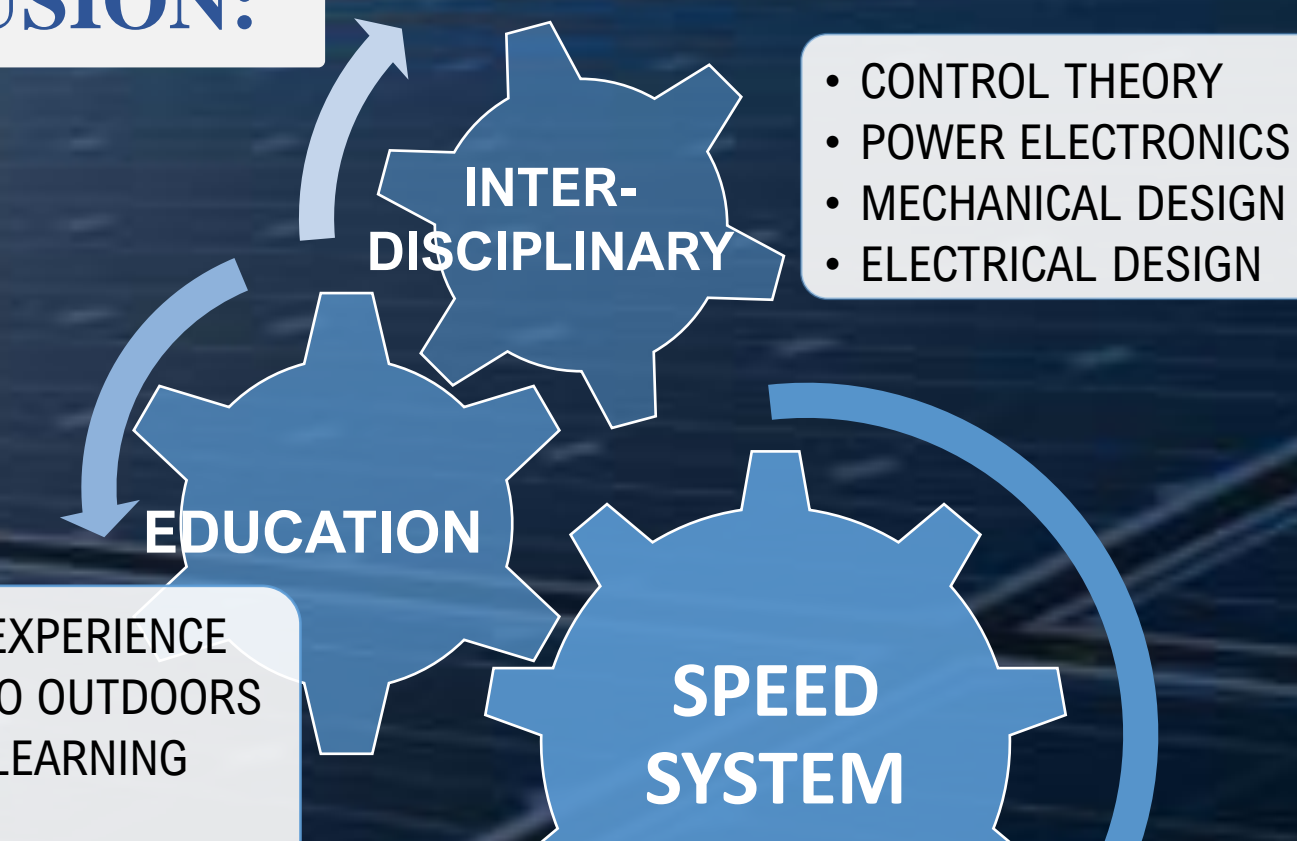


Fig. 2 Robust droop control

EXPERIMENTAL RESULTS:



CONCLUSION:

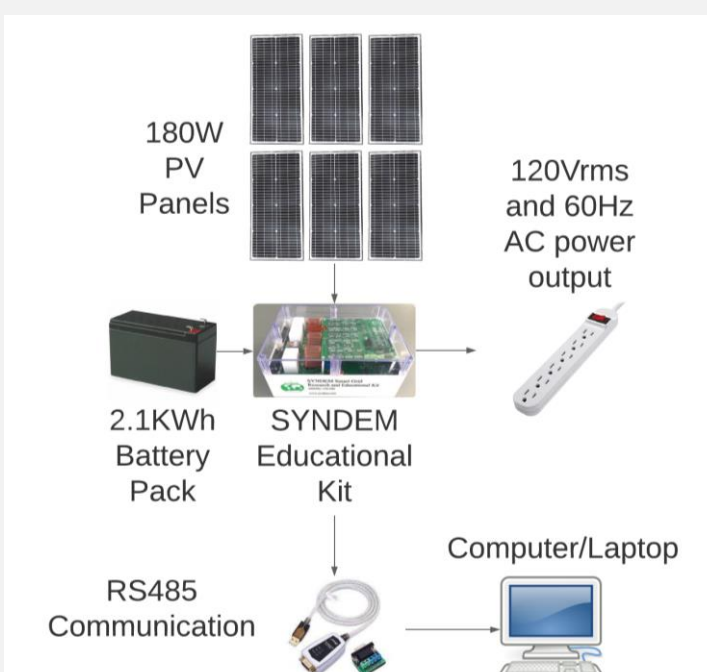


- HANDS-ON EXPERIENCE
- FROM LAB TO OUTDOORS
- POWERFUL LEARNING PLATFORM
- SHAPING THE FUTURE OF GREEN ENERGY

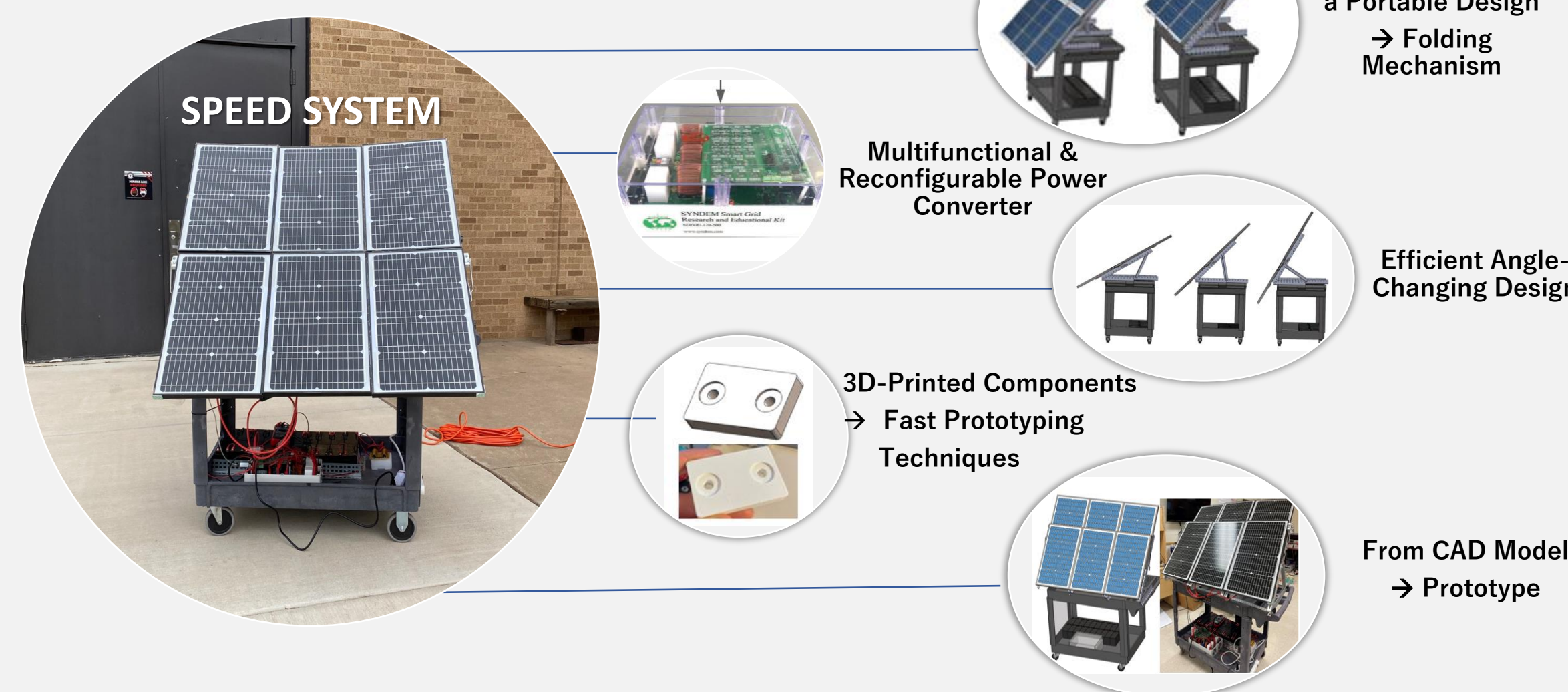
This platform will help next generation engineers shorten the learning curve with hands-on experience and improve education productivity and efficiency.

SYSTEM DESCRIPTION:

- » Six solar panels are connected to harvest solar energy.
- » A battery pack is used for energy storage.
- » A SYNDEM Smart Grid Research and Educational Kit integrates the PV source, the battery pack with a standard utility-level AC output
- » A computer/laptop is used to monitor and record both system operation data and control data through the RS485 communication with the SYNDEM Kit.



DESIGN:



ACKNOWLEDGEMENT:

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