

# UNIVERSITY OF SOUTH FLORIDA

## *Defense of a Master's Thesis*

*A Communication Protocol for Nanogrids and its Application in Off-Grid Rural Areas of Developing Countries*

by  
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*For the MSCS degree in Computer Science & Engineering*

*In India, 44% of the population does not have access to electricity and for many others, the utility grid is unreliable. A nanogrid, defined as "a single domain for voltage, reliability and administration", is a possible solution to distribute power to such off-grid areas. This thesis designs a new communication protocol for nanogrids to match the current demand of the loads to short-term limited supply from the source. The Link Layer Discovery Protocol (LLDP) can be used to enable communications about power. Simulation evaluation of a nanogrid with communications about power in a developing country is presented. Results indicate that in the worst case scenario (in December, initial battery level = 20%), there is an 82% decrease in unmet demand (kWh). We conclude that communications about power in a nanogrid enables better matching of demand with short-term limited supply.*

*26<sup>th</sup> May, 2016*

*1 pm*

*ENB 313*

THE PUBLIC IS INVITED

### *Examining Committee*

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