

2nd International Conference & Expo on **Green Energy, Recycling & Environmental Microbiology**

November 28-30, 2016 Atlanta, USA

Sustainable energy performance: Bio-inspiration from thermoregulation of the termite mounds

Silvia Titotto and Helena França
Universidade Federal do ABC, Brazil

Statement of the Problem: There is strong evidence of openings of possibilities for new paradigms for construction projects from recent research results that found that termites act as a lung that breathes once a day, driven by temperature changes between day and night, expelling carbon dioxide that accumulates activity of subterranean termites.

Methodology & Theoretical Orientation: This research examines biomimetic mechanisms of thermoregulation in termite mounds and aims to develop technological innovations for the built environment for greater energy efficiency, promoted by the thermoregulatory processes of these social insects. The methods of this research have been based on verifications at experimental modeling via computer graphics and by rapid prototypes that have been built from recent literature data.

Findings: The preliminary results contrasts with longstanding assumptions biologists had that the termite mounds existed both to dissipate heat from the nest or ventilation in response to external air flux and confirms the recent trend in the field.

Conclusion & Significance: This research has also reached social dimension when it aimed technical solutions that could also be applied in the future to emergency situations resulting from natural disasters, for example, or even cultural events in areas without energy infrastructure. Possible expansion of future proposes energy grid high performance, following non-linear geometry branches, which probably could significantly reduce costs for the local populations.

Biography

Silvia Titotto pursued PhD at Politecnico di Torino, Italy in the field of Technological Innovation for the Built Environment from 2010 to 2013. Her research focuses on biomimetics, in particular, robotic sensory structures inspired by nature. She pursued Doctorate at University of São Paulo (USP), Brazil in the field of Architecture and Design from 2009 to 2013 with research focus on chaos theory and fractals. She completed her Master's at USP in the area of Architecture and Design in 2008 researching on design and lighting of cables, inspired by the dew on spider webs. She received Bachelor's degree in Architecture and Urbanism at USP in 2004. She was Researcher of lightweight structures (cables and membranes) at Polytechnic School of USP from 2002 to 2004. She was awarded in Germany for research in non-wovens by NRAVEDANA in 2010. She is recognized by the Fundación Carolina (Spain) as one of the Top 50 Young Leaders graduated in Ibero-America in 2005. She worked as Young Full Professor in the fields of Architecture and Engineering at the University Anhanguera and Univeristy Paulista and a Temporary Professor of Design course at UNESP. She is currently a Post-doctoral Researcher at UFABC about Bio-inspired Deployable Structures.

silvia.titotto@ufabc.edu.br