



Cornell University

# Thermoregulatory Clothing System for Building Energy Saving

PI: Jintu Fan (Cornell FSAD)

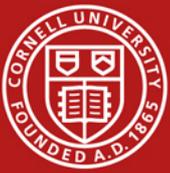
Co-PI: Huiju Park (Cornell FSAD)

Co-PI: Tasha Lewis (Cornell FSAD)

Co-PI: Edwin Kan (Cornell ECE)

Co-PI: Ronggui Yang (U Colorado ME)

*Duration of award: 3 Years (04/27/2015-04/26/2018)*



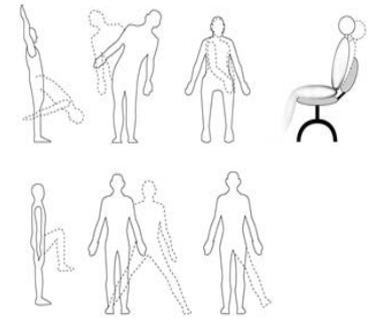
# Technology Features/Advantages

- Integration of advanced textile technology, functional apparel design and state-of-the-art wearable electronics.
- Lightweight *Thermoregulatory undergarment* (TRUS ) for distributing cooling or heating power around the body surface.
- Compact and detachable *electro-mechanical device* (EMD) for energy conversion, sensing, control and wireless communication.
- 100% washability after detaching EMD
- Additional weight <10% of normal business attire.
- No compromise in comfort and mobility.
- No effect on personal choices in fashion, color or texture.



# Validation Plan & Performance Targets

- Prototypes at end of Y1, Y2 & Y3
- Manikin & other Lab Tests
- Human subject wearer trials
- Consumer adoptability Assessment



Metric	State of the Art	Proposed
Thermal Performance	<10 W cooling No heating	>23 W cooling >18 W heating
Appearance	-Visible surface change -Interference with consumer color or texture choices	-No visible surface change -No interference with consumer color or texture choices
Sensing & control	No	Yes
Cost	\$140	\$11 plus, \$30/year/person



# How the DELTA Community Can Help

- High energy density energy storage technology
- High COP energy conversion technology
- Far distance wireless induction charging technology
- High pressure, low noise and compact air moving technology
- Control algorithms of HVAC system for multiple indoor occupants with varying requirements
- Commercialization partners