AATCC California Chapter Technical Section Meeting-Wearable Technology

March 13, 2019 6:00 PM at Levi's in San Francisco

Start of Meeting 6:18 PM

Introductions by Trish Hayes-Danitz-AATCC California Section Wearable Technology Pillar Chair

- Gus Jones
    - Technical Service Consultant for Dupont
    - 12 years' experience across the printed electronics value chain
    - Has led a variety of projects including Nano Silicon inks for photovoltaics
    - Most recent project has included application engineering for Dupont IntexarTM for fitness, heating, and healthcare applications
- Meg Grant
    - Creative Soft Circuit Technologist at BeBop Sensors
    - Worked with Google's Project Jacquard in 2013
    - Currently working at BeBop sensors, a Berkeley startup, which specializes in textile-based pressure sensing technology
- Valerie Root
    - Senior Environmental Health and Safety Specialist
    - 10 years in hazardous waste management expertise
        - Supports clients in end of life waste management and practices for Biomedical and other industries

Presentations

- Gus Jones-Technology at Dupont
    - 80 years in the textile industry working on materials such as Nylon, Kevlar, etc.
    - Highly involved in electronics
        - Not many consumers know this
    - 95% of smart devices
        - Electronic materials
    - Allows you to put wiring in to allow functionality in smart garments
        - Two films
        - A conductive paste, heat transfer, the inks are screen printed
        - Manufacturing ready
        - It's washable and fabric like (has hand feel/drape)
        - Two silver inks
        - The carbon sensor acts as a protective layer in the sensor area
        - Base film used to heat press
            - Seam tape
        - TPU film used for washing and environmental protection
        - Electrical Performance
            - There is a change in resistance when stretched
        - Regular wire has no stretch
            - Resistance-no change
        - Dupont materials-the ink moves
            - Allows for stretch and conductive polymer ink

- Washable
    - AATCC 135 cold wash, air dry
    - After 50 washes, it had minimal increase
- 3 Markets
    - Fitness
        - Bodyplus
        - Sports bras, men's shirts
        - Silver pads to make body contact
        - Silver trace in center, makes connection to a dock
        - Tracks heart rate and sends information to phone
    - Heat
        - Ralph Lauren Winter Olympics
        - Carbon used as a resister and gives off heat
        - Usually a waste product, but was useful in this garment
        - By 160 seconds, the whole panel heats up
        - Maintains heating profile up to 2,000 cycles
    - Health
        - Owlet Brand
            - Connects with expectant mothers with their children
- Questions?
    - When washing items with the silver particles in them, how does it react with our water?
        - The silver particles and resin stay together and on the TPU, so there is no free silver to enter water system.
    - There is an increase in resistance over washes, why is it increasing?
        - The particles are not washing off, but more of a mechanical damage.
        - Tested with Heat? AATCC 135
            - Yes, survives up to 25.
    - Can you build batteries in textiles?
        - No screen-printed solution for batteries. You can put a battery pack into a garment. High power applications can use wiring.

- Meg Grant Presentation
    - E-Textile Product Developer
    - LED Matrix
        - See-through-me garment
            - Simulates the look of light being shined through you
    - Automate work?
        - Conductive lace, press on lace sensor and a poem is read through speakers.
    - Optic Fibers, stripped coatings, to pull light from the environment, tiny solar panel and the end bundles, generate some electricity
    - TE Connectivity
        - Project Jacquard with Google/Levi's
        - Commuter jacket with senor embedded in the sleeve
            - Allowed the used to make phone calls, swipe music, etc.
    - Seismic Inc.
        - SRI International's robotics program developing powered clothing
        - Developed for DARPA, soldiers to carry things longer.

        - Electro-mechanical muscles across the body, helps support walking.
    - BeBop Sensors
        - Textile-based pressure sensing technology
        - Textile in circuit, you can measure deformity
        - Example:
            - Car seat- measure pressure, fatigue and who's been sitting in the seat
        - Can be used in shoes/sports apparel industry
        - Data glove-was recognized in Time Magazine as product of the year in 2018 in that category
    - Textile Waste/Environmental Affects
        - As developers, we need to start thinking of this
        - Institute for the Unstable Media
            - E-waste topics provided by Andrea's work
                - Annual used apparel waste estimated at 16M tonnes
                - 95% of landfill textiles could be recycled or reused
                - Smartphone production tripled from 2000-2014
                - Worldwide E-waste volumes expected to surpass 65M tonnes in 2017
                - Design phase impact: waste prevention by design is a far better strategy than end-of-life treatment and recycling
                    - Amount of materials
                    - Choice of materials
                    - Scarcity and "special waste"
                    - Copper is 1.4% of the eco-costs of silver
                    - Secondary effects: aluminum, PET, etc.
    - Questions
        - The question of privacy in these products?
            - Data is a resource and the user should be able to choose to share, not mandatory.
- Valerie Root Presentation
    - Senior Environmental Health and Safety Specialist
    - Experience in hazardous waste
        - Universal waste is a subset of hazardous waste, which includes electronic waste
            - Toxic metals such as lead and mercury
    - California E-Waste Regulations
        - Electronic Waste Recycling Act 2004
            - A program for consumers to return, recycle and ensure safe and environmentally sound disposal of electric devices
            - When you purchase a TV, you pay $6-$10 for the disposal fee
    - Purpose of E-Waste Laws in CA
        - To limit the amount of toxic substances in certain electronic products sold in California
        - To establish a funding system for the collection and recycling of discarded covered electronic devices
    - Recycling Electronics
        - Take it apart and remove batteries
            - Take this into design thoughts

        - Shredding/granulating
    - Consider the Source
        - Toxic In-Toxic Out
            - Is the material recycled/recovered or now?
            - Is there a lower hazard alternative?
            - Is it manufactured in a safe way?
            - Is it necessary?
    - Questions
        - What are the most hazardous materials?
            - Lead and Mercury (soil, atmosphere)
            - Circuit Boards, screens
            - Disposal-certified recycling-using acids
        - What do you do with biohazard/medical waste?
            - Blood/infectious items/chemo dugs/pharma items
                - Needs disinfected with bleach and put down the sewed
            - Solid waste put in red bags and incinerated
        - Any long-term research done on lead from e-waste that accumulates in the body?
            - Studies are done through blood.
            - Lead levels are currently down, especially when less present in our environments
                - No more lead in paints, gasoline
        - Any companies that design backwards with the end in mind?
            - Example is Patagonia!
- Panel Discussion
    - Are there any AATCC Committees looking at environmental waste?
        - Sustainability Pillar-recycling/reducing
        - Carol-2019 conference focused on soil/sea in October
            - Regenerative farming
    - What methods are still needed to evaluate E-textiles?
        - Everyone has slightly different needs
        - One standard published EP13
    - Hemp legalization and usage in textiles?
        - The processing of hemp is higher and uses more water
        - HIGG Index is a resourceful tool (MSI)-free
            - You can compare materials on there
    - Privacy in medical devices?
        - Data shouldn't be stored on that specific device but uploaded to a cloud
        - Designed for theft
        - Example
            - Temporary data tattoo that monitors the baby during pregnancy
                - Who owns the data? Women or hospital?
                - Many medical device companies comply heavily with HIPA
    - I know certain machinery has had to be utilized in order to execute a new process (i.e. to make the lace that read a poem), but how often is a whole new machine needed in order to create a new process that is effective?

        - Machinery is built very often, usually in house and on the spot in order to create new processes.
    - April 15th Student Engagement Pillar Chair Meeting
        - Students interviewing Textile Sustainability Professionals
- End of Meeting 8:01 PM