## Uncovering the afterlife of discarded electronics

With a new project on display at The Museum of Modern Art in New York, MIT researchers explore what happens to used electronic devices after they leave our possession.

** Videos and Images available at: http://senseable.mit.edu/backtalk

CAMBRIDGE, Mass. -- MIT researchers who have been studying the fate of used and discarded electronics will unveil some of the results of their work in a series of real time visualizations that are part of a new exhibition at The Museum of Modern Art in New York. The visualizations shed light on what becomes of the large volumes of electronic refuse that are generated annually, and on the "second life" of used computers that are adopted by new owners. The visualizations are entitled *backtalk*, and are part of the new exhibition, "Talk to Me: Design and the Communication between People and Objects," which opens to the public on July 24th.

"As our objects, buildings and cities become digitally controlled and 'smarter', they are also being embedded with an increasing amount of electronics," said Carlo Ratti, director of the MIT Senseable City Lab. "But what happens to these electronics once they are discarded? This is what our project set out to explore. Initial results provide an unprecedented glimpse into the global e-waste chain and its patterns of reuse and disposal."

As part of their research, the MIT team developed two different types of tracking technologies to follow obsolete electronics as they travel across the world for recycle or reuse. To study reuse patterns, they partnered with several non-governmental organizations who ship used, donated computers from the United States to emerging countries. Refurbished laptops were programmed to detect their own location and capture images using their built-in camera. With the consent of their new owners, the data is sent to MIT in real-time and used to construct visual narratives about the computers' "second lives."

"The popular notion of the intelligent device usually remains limited to its lifespan as a consumer product," says project leader Dietmar Offenhuber. "However, the digital imprints and histories these devices accumulate often outlast their consumer life."

The second part of the visualization on display reveals the traces of e-waste traveling across the United States. The team employed GPS-enabled wireless location trackers to map the movement of batteries, cell phones, printer cartridges, and other devices discarded by volunteers in Seattle, Washington. Results show the journeys undertaken by e-waste, with some items crossing the entire country on their way to recycling facilities. The project raised some important questions, including whether the environmental damage from transportation emissions outweigh the benefits of recycling.

"The large volumes of electronic refuse generated annually present both a toxic liability and a potentially valuable resource," said Assaf Biderman, the lab's Associate Director. "One of the consequences of digitizing our everyday objects is that the data they capture provides us with new information about the impact of our actions – from what we consume, to the waste we discard, and to the things we give away."

"We can now judge for ourselves if our donated computers really find a new home, or if our e-waste is proving harmful," says David Lee, a programmer for the project. "We can see if our actions truly reflect our best intentions."

Collaboration with Qualcomm Incorporated and LG Electronics helped make the global tracking technology project successful. Outreach partners included World Computer Exchange, the Peace Corps, and World Teach.

The *backtalk* team at the Senseable City Lab includes Carlo Ratti, Assaf Biderman, Dietmar Offenhuber, David Lee, Jennifer Dunnam, Paolo Patelli, Aaron Siegel, E Roon Kang, Francesco Pilla, and Douglas Albert.

Project website: http://senseable.mit.edu/backtalk

For more details about the project, please contact: senseable-press@mit.edu