Kent Lyons
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I create and evaluate interactive technologies for wearable, mobile and ubiquitous computing/IoT. I do this through designing, prototyping and evaluating systems that span the platform stack including sensing, embedded, wearable, mobile and web. Some of these are one-off proof of concepts I create while others are prototype deployments spanning dozens to thousands of users. I evaluate these systems on a technical basis or through user studies to collect data about key questions.
I have personally presented to and advised senior management on key technologies (including the CTOs of Intel, Nokia and of Connected Home at Technicolor). I am a currently a Principal Scientist at Technicolor in Los Altos, CA; previously, I worked for advanced R&D for several companies. I also was cofounder of my own startup, an app for the Pebble smartwatch (25k+ installs after ~3 months).

EMPLOYMENT HISTORY
- Principal Scientist, Technicolor (Los Altos) 2015-
- Co-Founder, WatchPop, Inc. (San Jose) 2015
- Principal Research Scientist, Yahoo (Sunnyvale) 2013-2015
- Principal Researcher and then Manager, Nokia (Sunnyvale) 2012-2013
- Research Scientist, Intel (Santa Clara) 2007-2012
- Research Scientist, Georgia Tech (Atlanta, GA) 2005-2007
- Research Intern, Intel (Berkeley) 2002
- Research Intern, Compaq (Digital) Western Research Laboratory (Palo Alto) 2000

EDUCATIONAL BACKGROUND
- B.S. Computer Science (1999), Georgia Tech
- M.S. Computer Science (2001), Georgia Tech
- Ph.D. Computer Science (2005). Georgia Tech. Advisor: Dr. Thad Starner

SKILLS
I was tech lead for many of the projects listed below as an IC and I transition to be the team manager at Nokia. I've mentored over 20 interns. I've held numerous leadership roles for several academic conferences (including the General Chair of ISWC/Pervasive '11 with a budget of $200k).
I design, prototype and evaluate the interactive systems I create using Python, embedded C, and sensors for user input and associated processing. I also worked with and deployed systems using BLE, Arduino, Android, Smart Watches, and used applied machine learning (HMMs for gestures, particle filters, deep learning, etc.).
I've designed and conducted numerous user studies using both quantitative and qualitative methods (controlled lab studies, surveys, open ended interviews and observations, evaluations in the wild, etc.).
I have worked closely in and with multidisciplinary teams spanning hardware, mechanical, firmware, cloud, interaction design, and user research. I have extensive first-hand experience building and evaluating a wide variety wearable and IoT technologies.

PATENTS and PUBLICATIONS
- 12 granted patents, 20+ patents filed and in progress
- ~40 top tier conference and journal publications in the domains of Wearable Computing, Mobile, Ubicomp and HCI including 1 best paper & 3 honorable mentions

SELECTED PROJECTS
- *Cardboard++ (2016) & uTrack (2013)* These projects use magnetic field sensing and physical models to provide continuous pointing input. Cardboard++ provides continuous 2D input using just a phone, a magnet and algorithms I developed. uTrack was created with an intern I managed to track a permanent magnet in 3D using two magnetometers. It let a user rub their fingers together like a trackpad for continuous input. This was evaluated with a lab user study. https://youtu.be/P_JPEVTeA-A & https://youtu.be/kSR_UAqJNPc

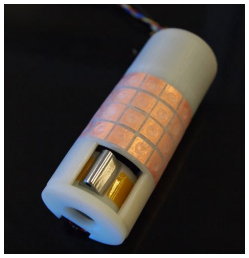
- *Twiddler for Glass (2004 ,2016)* The Twiddler was used extensively by some pre-Glass wearable users (I did several longitudinal lab evaluations of it and other keyboards and found experts could burst to 100+ WPM). Glass support for HID devices was often in flux, so I created a custom BLE Twiddler (based on the Nordic nrf51822) and a Glass/Android app with an ARM build of Emacs that runs full screen and connects directly over BLE. I also 3D printed replacement key caps. This lets me use Glass as a much improved version of the wearable I started using in 1999.

- *WatchPop (2015*) As cofounder, I designed, developed and deployed a Pebble Smartwatch app and associated infrastructure. We launched and grew to 25k installs in 3 months and were featured by Pebble several times. I was central in the architecture and development of the entire product stack with the watch, phone and cloud backend. I also lead data analytics.

- *Dumb Watch Survey (2014)* Smartwatches are largely positioned as a companion to smartphones. However, society has largely abandoned wristwatches in favor of using the phone as a timepiece. I conducted an online qualitative survey and analysis to understand how smartwatches might be informed by the current practices of digital watch wearers. This was part of a larger investigation using Innovation Theory as a tool to understand smartwatch design.

- *Shimmering Smartwatches (2015)* As technical lead working with an engineer, we designed & developed several watch prototypes focusing on devices that could provide smartwatch capabilities but not look like small phones attached to the wrist. We focused on designs without high resolution graphical displays. I created embedded C code for the Nordic nrf51822 BLE SoC and an associated Android app. I guided the engineer to 3D print watch forms, design and fab a PCB, and develop the interactions focusing on output. I ported the Arduino NeoPixel library from AVR to ARM assembly. https://youtu.be/wz8lx7-fJxo

- *Loupe (2014)* Reflecting on the social challenges highlighted by the press for Google Glass, we created a handheld device that incorporates a near-eye display. The user picks up Loupe to see a virtual image and manipulates the device and its surface to provide input (inertial and capacitive sensing). I managed the team and lead the vision for this proof of concept. The project lifecycle start with initial design ideation and brainstorming through the creation of the functional prototype.
https://youtu.be/D8tjXgjB2nc



- *BitWear (2013)* This is a platform for small wearables and IoT using BLE. I architected the overall system and developed the cloud backend in Python using ZMQ, Bottle, websockets, and MongoDB to create a worldwide event queue for these devices. This was deployed with doezens of units released internally as well as given to senior executives and the board at Nokia. We also conducted formative studies using an in-situ diary study and low fidelity prototypes.

- *Facet (2012)* I designed & prototyped a multi-display wrist worn system with multiple touch-sensitive watch-like segments joined into a bracelet. I used 6 WIMM smartwatches and the onboard sensors to determine segment membership and configuration. The distributed system provided window manager like capabilities for moving content across segments. https://youtu.be/4FrfwILT3nQ

For a list of projects, see my web page (http://kentlyons.net/projects.html) or my full CV (http://kentlyons.net/kent_lyons_cv.pdf).