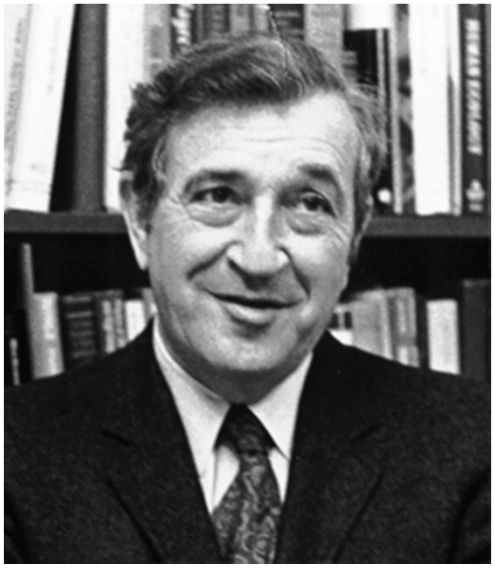
The More Things Change…

Susanne Seitinger, PhD
Senior Technologist, Philips Color Kinetics

Oh, the Places You'll Go, If You Have Smart Lighting
Detroit, MI on November 13, 2014
Dept. of Energy Market Development Workshop

MIT Media Laboratory

Tale of Two Buildings



"The study of man-made and living systems will prosper in an environment where they can nurture each other."
Jerome Wiesner, *Media Lab co-founder, MIT President (1971-1980)*

Photo Credit: The MIT Tech.

Rethinking the Automobile (2010)
Imagining MIT : Designing a campus for the twenty-first century (2007)
Trilogy of digital cities: *Me++* (2003); *E-topia* (1999); *City of Bits* (1995)

Photo Credit: ED QUINN/MIT SPECTRUM.

MIT Media Laboratory

Tale of Two Buildings

Wiesner Building designed by I.M. Pei.

Photo Credits MIT hyperstudio : h + digital.
Completed 1985.

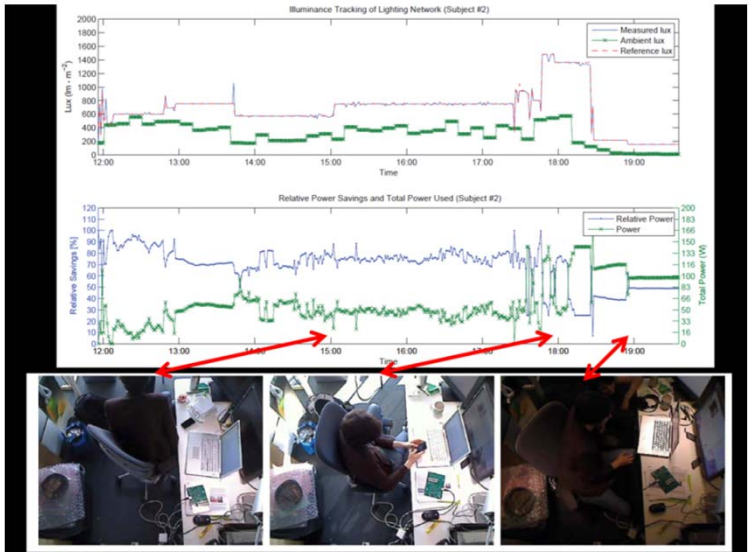
The Media Lab Complex designed by Fumihiko Maki.

Photo Credit: Andy Ryan. Completed 2009.

See interview with Bill Mitchell by Paula Aguilera, MIT Media Lab,
http://www.media.mit.edu/video/view/wjm-2010-03-06

Ubicomp Vision

From Seamless to Seamful*



Images from Adaptive Lighting research in Responsive Environments Group (Aldrich et al., MIT Media Lab, 2012)

(*) Seamful is a term borrowed from human-computer interaction, ubiquitous computing, especially when the digital and physical realms intersect.

Enabling Infrastructures

- Digital
- Networked
- Scalable (and resilient)
- Optimized for shared values (safety, sustainability, other values)
- Multiple levels of engagement for various stakeholders

Photo credit: Points Sign (pointssign.com)

		1950>> Industrial economy	1980>> Experience economy	Unfolding Knowledge economy	Future Transformation economy
People mindset	Captivating idea	Product ownership	Experience	Self actualization	Meaningful living
	View	Local	Global	Contextual	Systemic
	Quest	Modernizing one's life	Explore lifestyle identities	Individual empowerment	Address collective issues
	Effect	Productivity & family life	Work hard play hard	Develop your potential	Meaningful contribution
	Skills	Specialization	Experimentation	Creativity	Transformative thinking
	Approach	Follow cultural codes	Break social taboos	Pursue Aspirations	Empathy & cooperation
Business mindset	Economic driver	Mass production	Marketing & branding	Knowledge platforms	Value networks
	Focus	Product function	Brand experience	Enabling creativity	Enhancing meaning
	Qualities	Products	Product-service mix	Enabling open-tools	Inclusive value networks
	Value proposition	Commodities	Targeted experiences	Enable self-development	Ethical value exchange
	Approach	Persuade to purchase	Promote brand lifestyle	Enable to participation	Leverage cooperation
	Goal	Profit	Growth	Development	Transformation

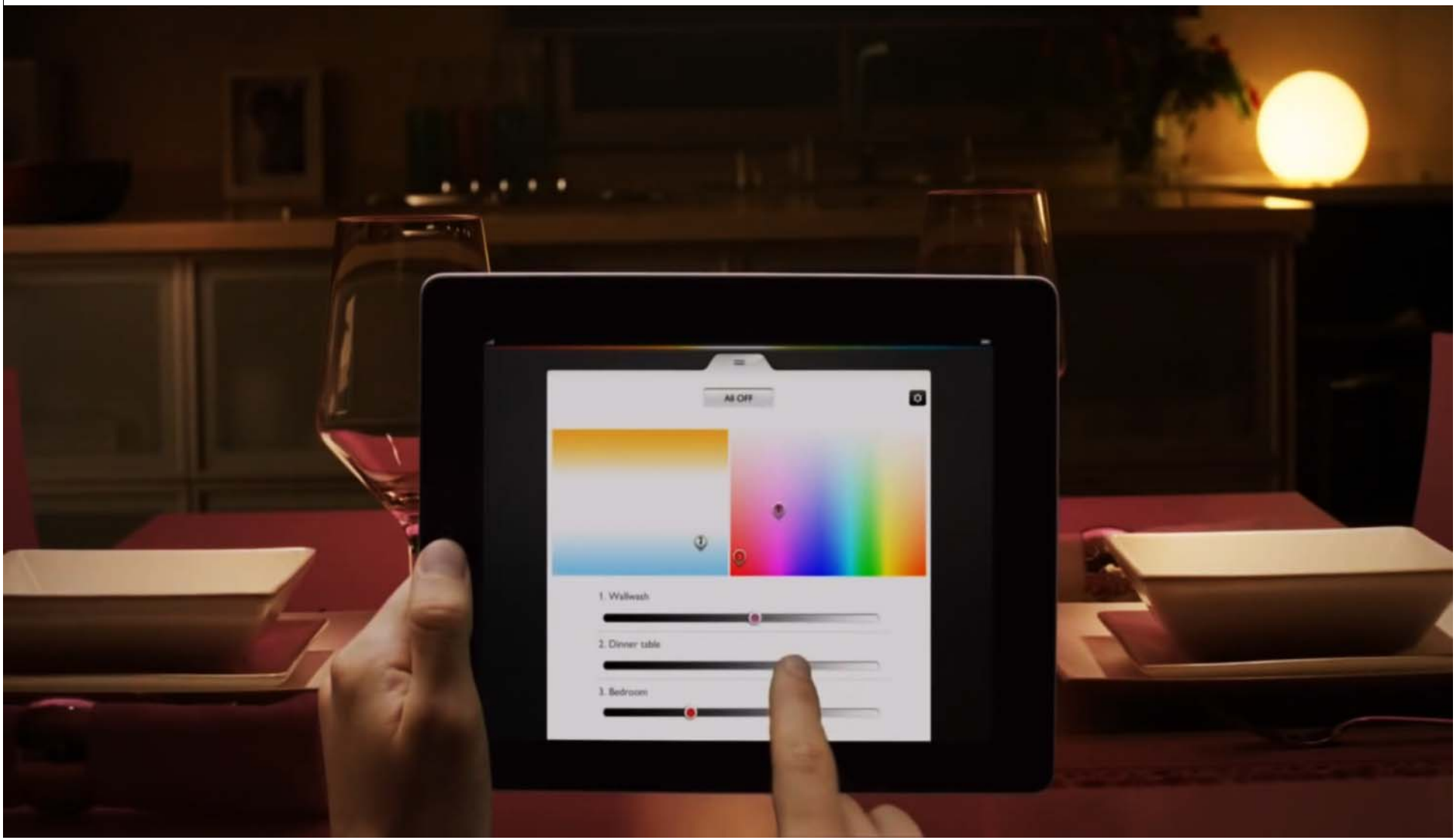
Reon Brand, Simona Rocchi, (2011). *Rethinking value in a changing landscape*, Philips Design.

LOCATION

ALARM

TIMER

IFTTT



Enabler for Location, Commissioning, and…

A.M. Vegni and T.D.C. Little, "Handover in VLC Systems with Cooperating Mobile Devices," to appear in *Proceedings of Mobility and Communication for Cooperation and Coordination (MC3) Workshop,* part of the IEEE International Conference on Computing, Networking and Communications (ICNC 2012), January 30 – February 2, 2012, Maui, Hawaii, USA. [pdf].

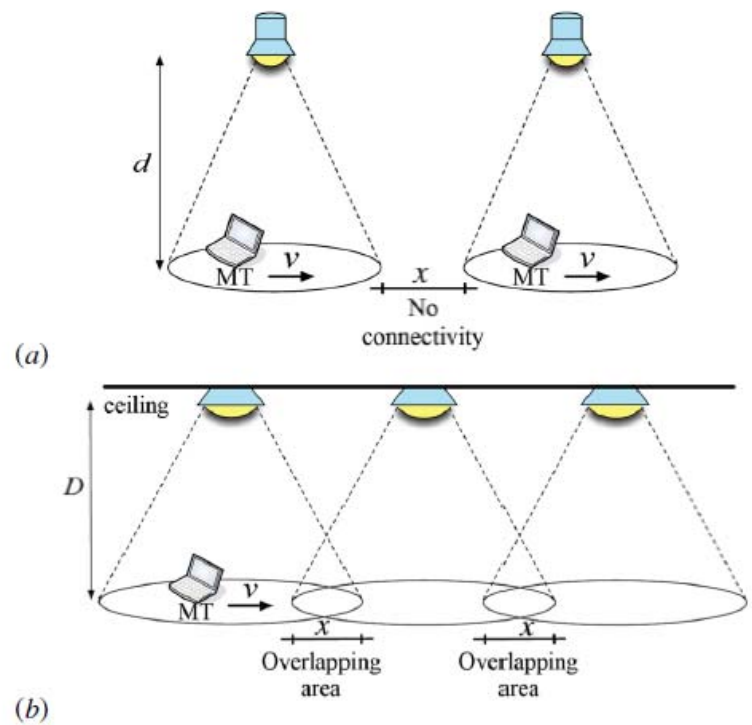
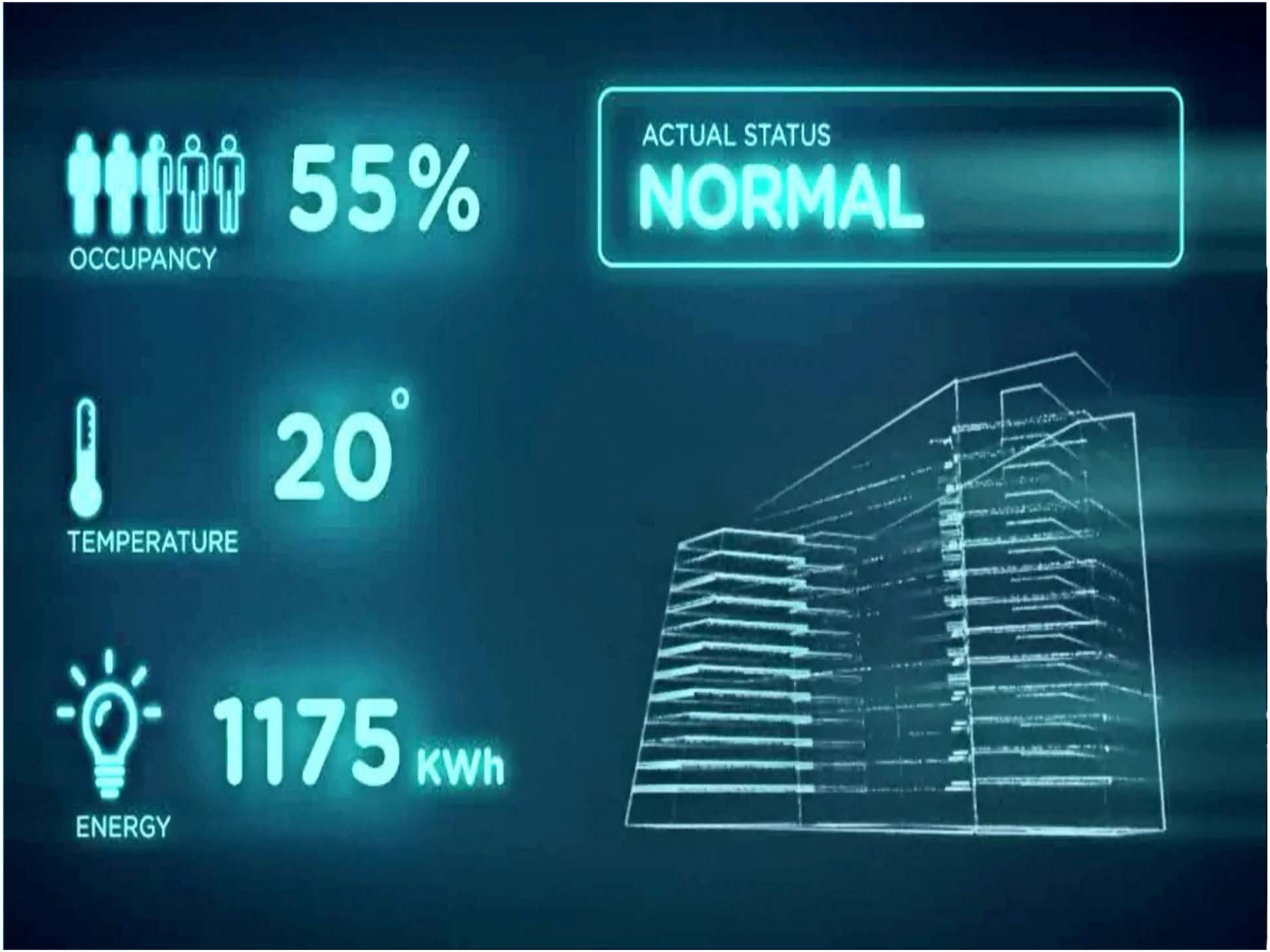


Figure 2: (*a*) Non-overlapping spotlighting, and (*b*) overlapping uniform lighting cells scenario, respectively.

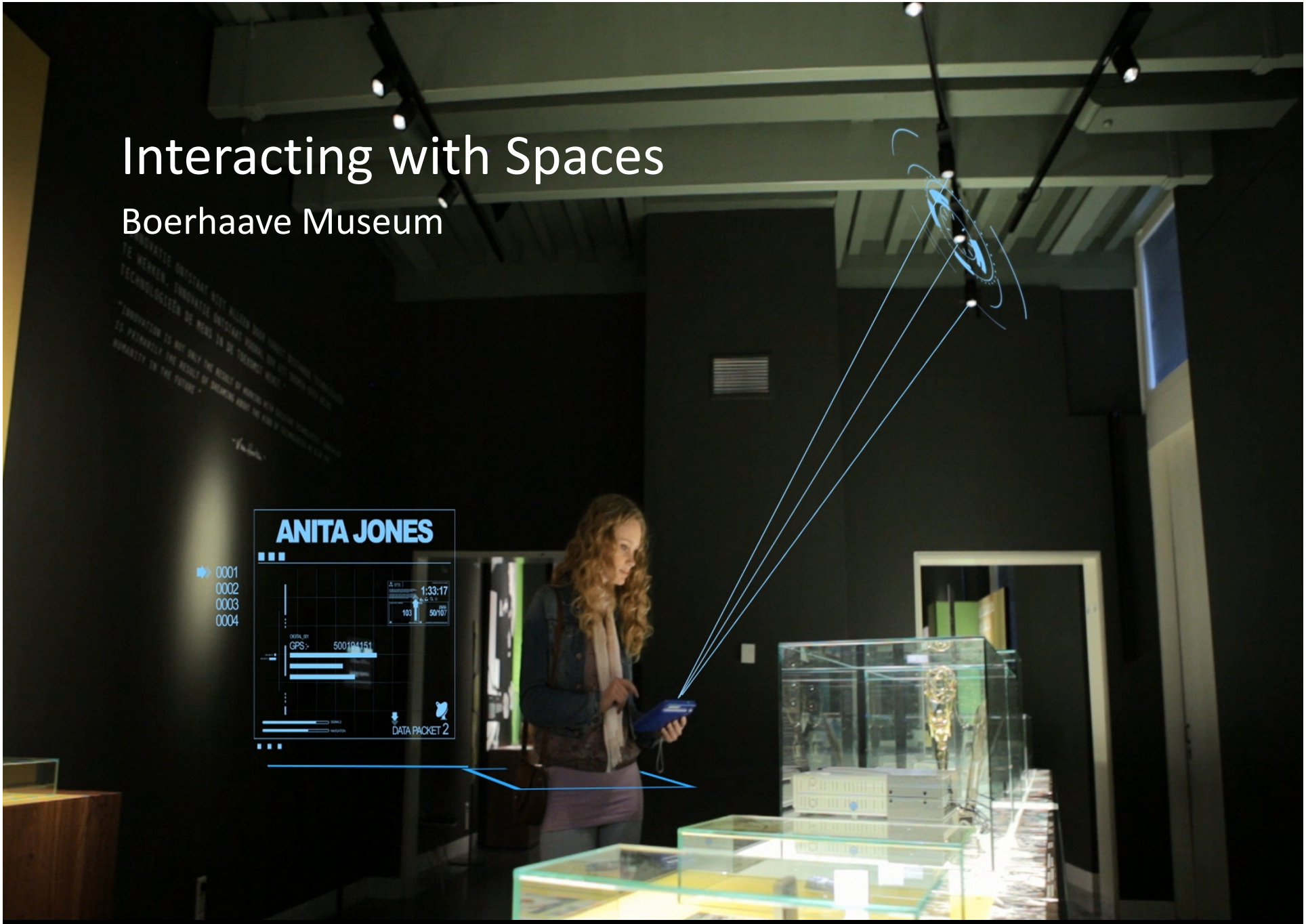
The Edge
Amsterdam, The Netherlands


55%
OCCUPANCY
ACTUAL STATUS
NORMAL
20°
TEMPERATURE
1175 KWh
ENERGY

Light Settings
Save
Break
Focus
Meeting
Brightness

Interacting with Spaces

Boerhaave Museum



Ambient Cues

Lightrail Station Paris, RATP Denis Sutton, 2006.

Proposal for embedded light pavers that announce the arrival of the train underground, 2004.

Chatzitsakyris, P., Ducla-Soares, G., and Zulas, A. (2004). IN-Visible. In *CHI '04 Extended Abstracts on Human Factors in Computing Systems* (Vienna, Austria, April 24 - 29, 2004). CHI '04. ACM, New York, NY, 1348-1350.

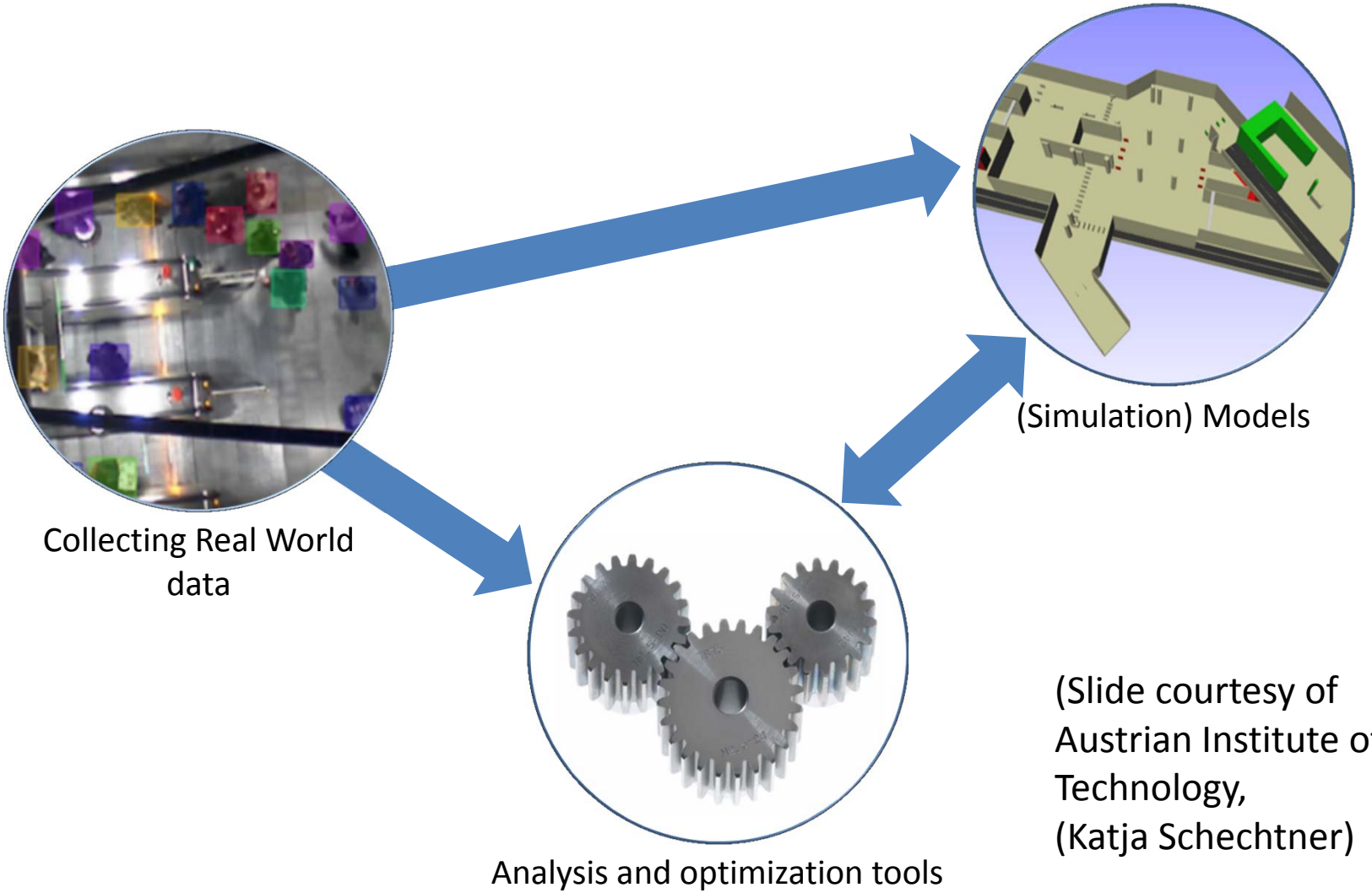
Washington D.C. Metro

Bill Lam

Bill Lam Tribute, IES Banquet (May 24, 2012) by Paul Zaferiou: “Bill applied principles of visual perception to inform decisions about what should be illuminated and why. The principles that he developed and stood for, we take for granted today. Bill may not have invented indirect lighting, but he took it to a whole new level in his quest for glare free environments. Lighting surfaces, like ceilings and walls, expand space and create the perception of brightness, resulting in visual comfort and interest.”

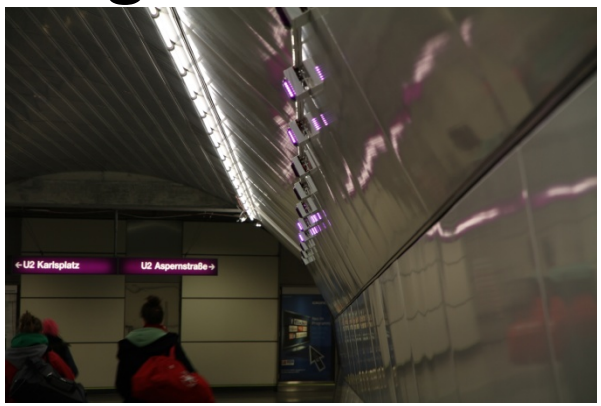
http://www.visitingdc.com/images/washington-dc-metro-subway.jpg
http://blog.lampartners.com/lighting-design/bill-lam-tribute-ies-banquet-may-24-2012.html

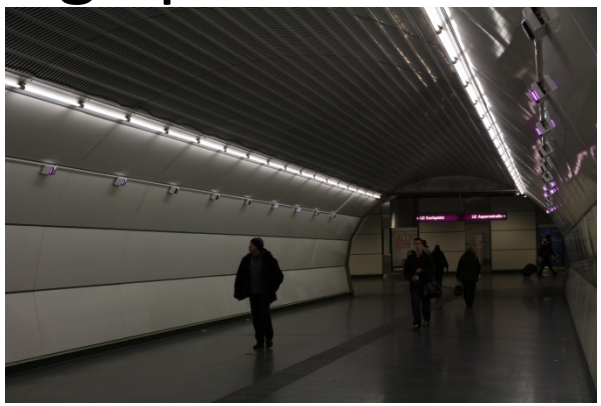
Understanding Crowd Dynamics

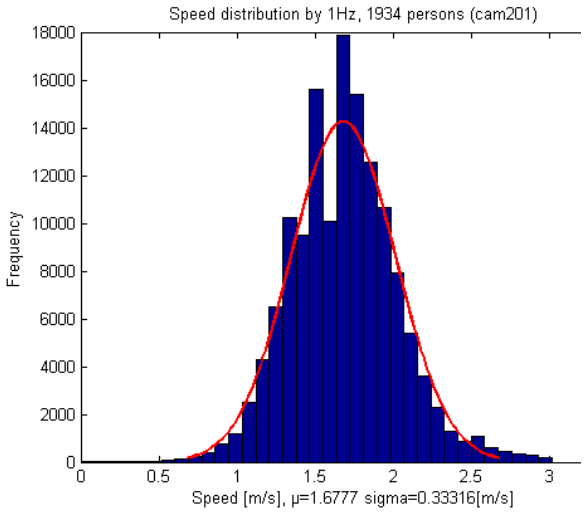


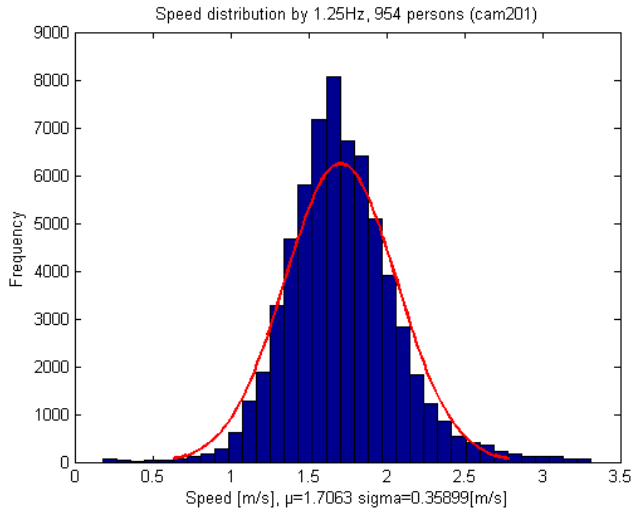
(Slide courtesy of Austrian Institute of Technology, (Katja Schechtner)

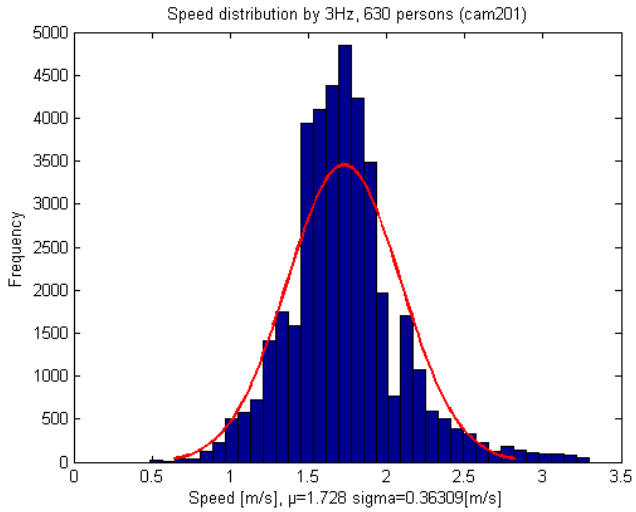
Impact of Lighting Cues on Walking Speed









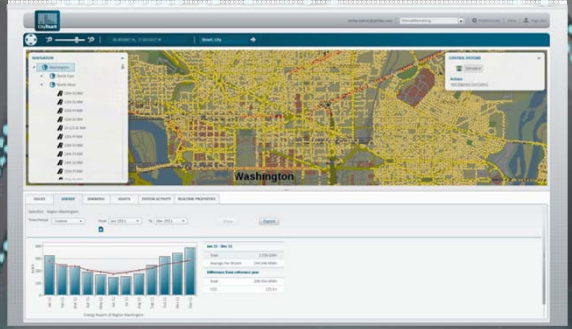


(for all passengers) 1.6777m/s @ 1Hz → 1.728m/s @ 3Hz

Seitinger, S., Canazei, M., Schrom-Feiertag, H. "LEDs on the Go: Supporting Pedestrian Flows in Public Transit Networks with Accent Lighting for Increased Efficiencies and Ambient Information Display," in *Proc. of 13th International Symposium on the Science and Technology of Lighting (LS13)* (Troy, New York, June 24-29, 2012). Selected as Landmark Paper Presentation.

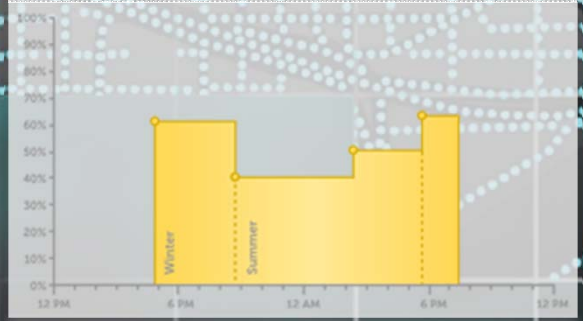
Leveraging Digital Light at the City Scale

Easy Access



Energy Reporting

Dimming Schedules



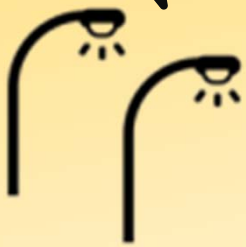
Leveraging Digital Light at the City Scale

Our industry has to focus on diverse stakeholders' needs: business processes, workflows and vision.

We have to support their operational workflows with state-of-the-art software …

… provide easy ways to connect to their light points …

… and continue to deliver the best lighting products, based on our deep lighting experience.



Diverse Stakeholders

Management Software

Seamless Connection

Public Lighting

Erwin Blumenfeld 1946,
reprinted 2008, *City Lights,*
C-type print, 40x30 cm

How much meaning per pixel?

Adapted from I/O Bulb, Underkoffler & Ishii 1999

light bulb I/O bulb liberated pixel

San Francisco, CA
Bay Lights
Leo Villareal
Photo Credits: Lucas Saugen

London, UK
Sosolimited
Architainment Lighting Ltd.
Photo Credits: Sosolimited

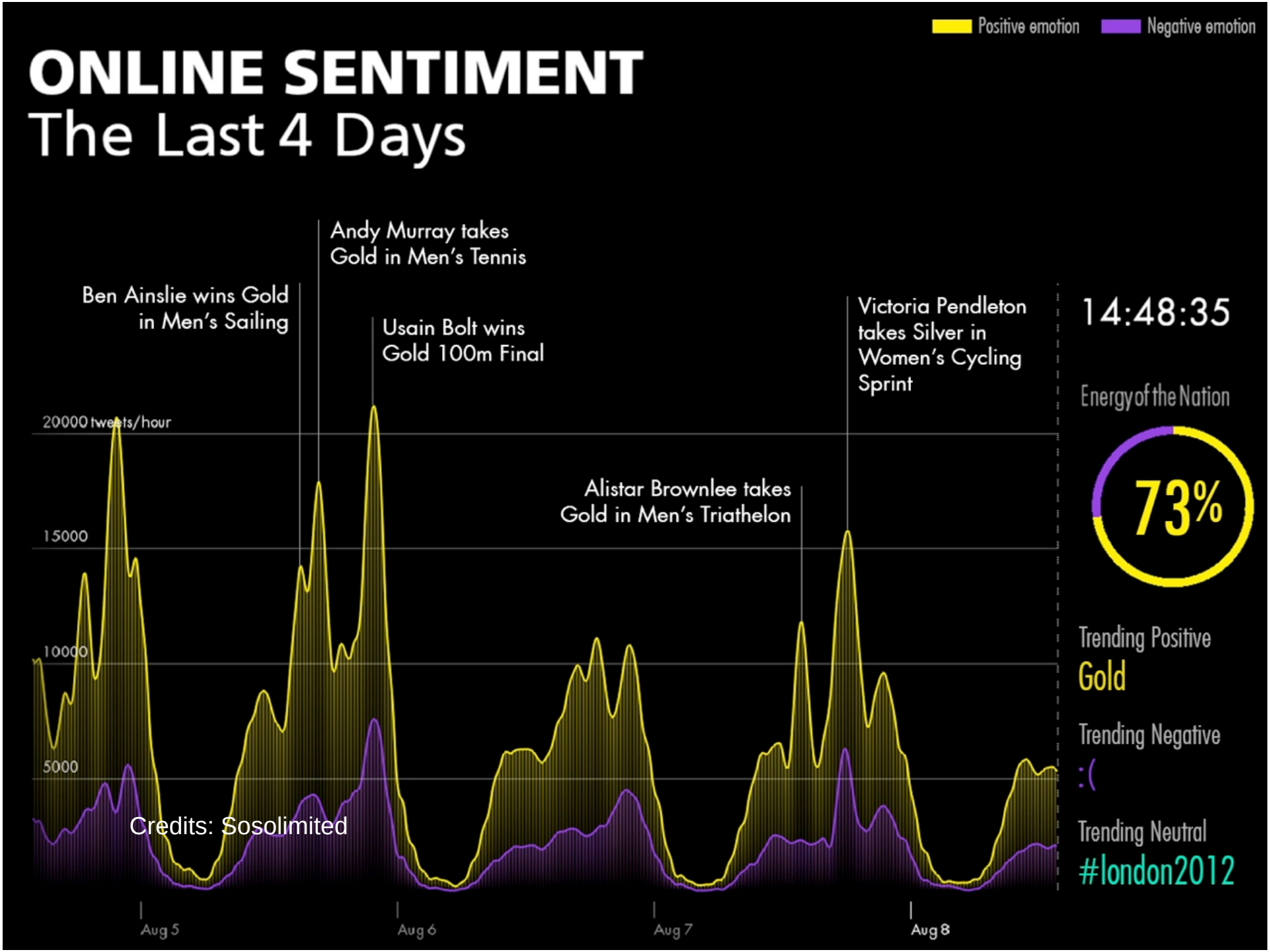

Positive emotion
Negative emotion
ONLINE SENTIMENT
The Last 4 Days
Ben Ainslie wins Gold in Men's Sailing
Andy Murray takes Gold in Men's Tennis
Usain Bolt wins Gold 100m Final
Alistar Brownlee takes Gold in Men's Triathelon
Victoria Pendleton takes Silver in Women's Cycling Sprint
20000 tweets/hour
15000
10000
5000
Aug 5
Aug 6
Aug 7
Aug 8
Credits: Sosolimited
14:48:35
Energy of the Nation
73%
Trending Positive
Gold
Trending Negative
:(
Trending Neutral
#london2012

Photo Credit: E. Karaman, D. Offenhuber, and Maria Amasanti
See also: http://www.youtube.com/watch?v=zsJlY-4z4Co

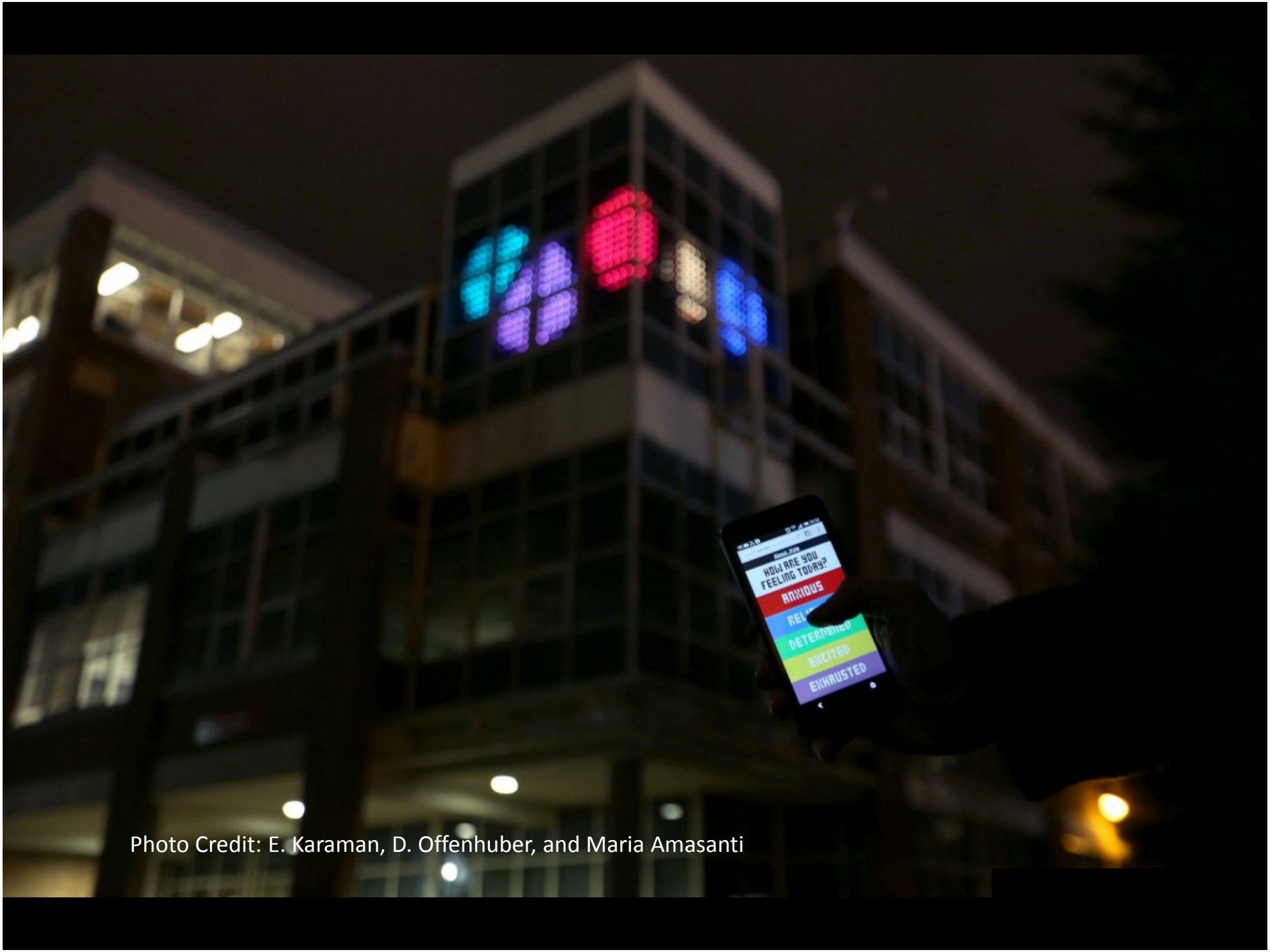
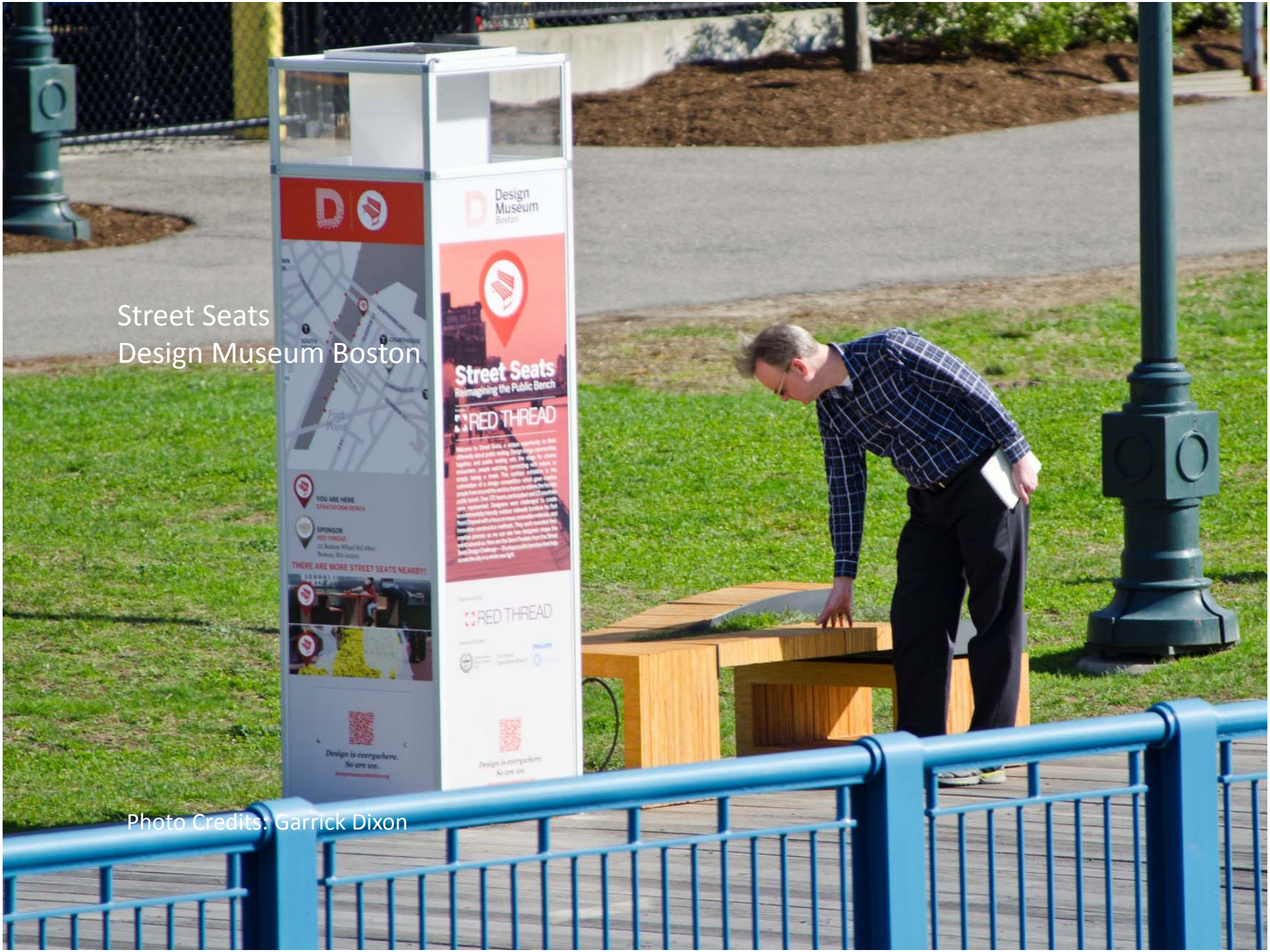
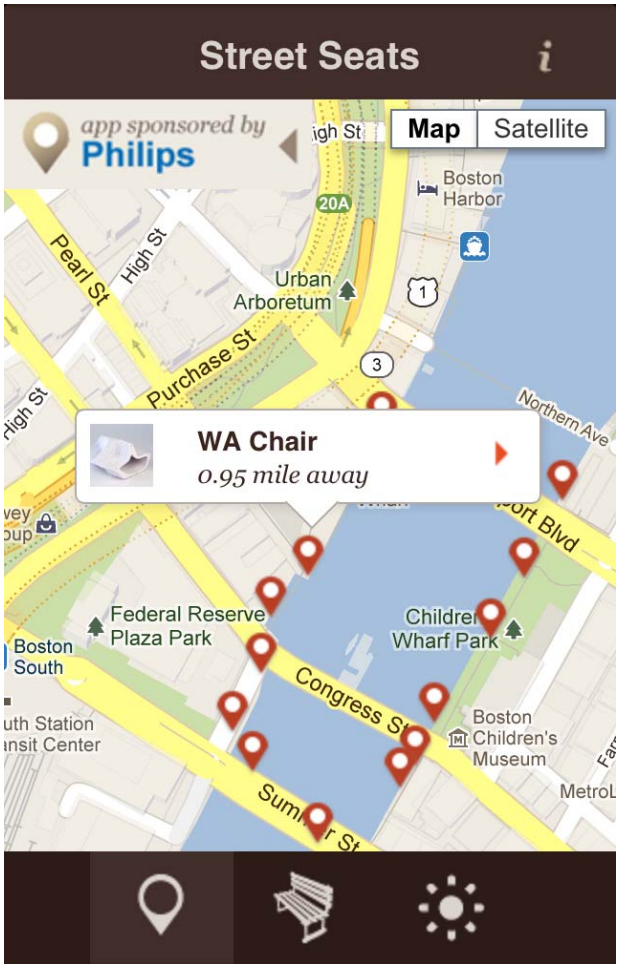


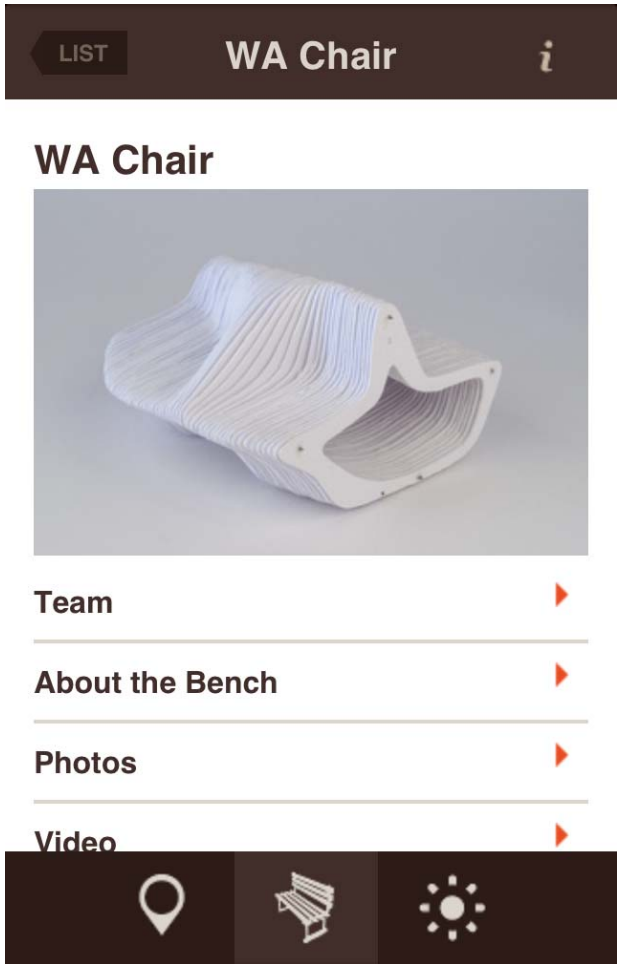
Photo Credit: E. Karaman, D. Offenhuber, and Maria Amasanti

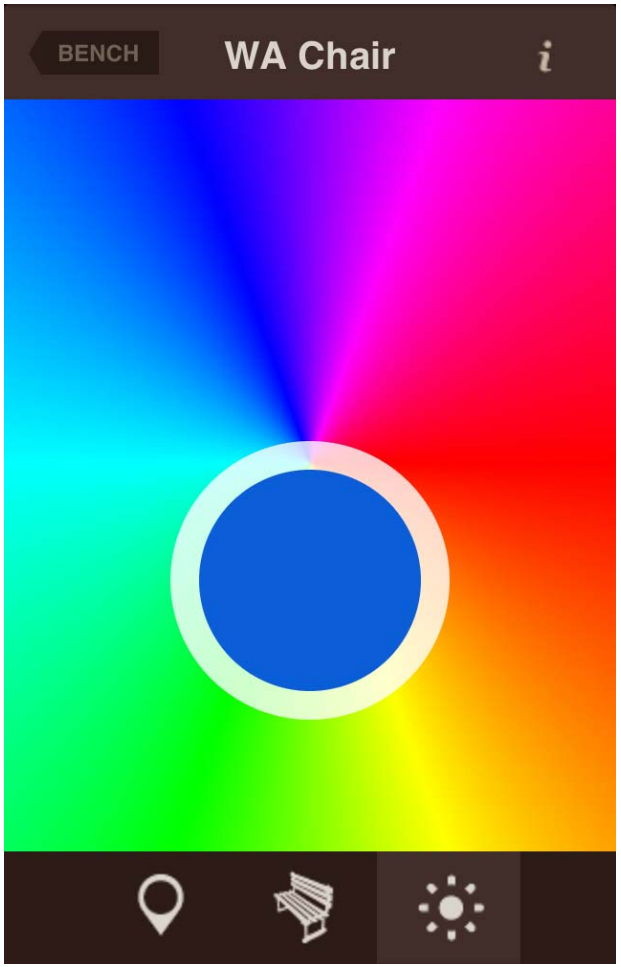


Street Seats
Design Museum Boston

Photo Credits: Garrick Dixon


Street Seats
app sponsored by
Philips
Map
Satellite
Boston Harbor
20A
Pearl St
High St
Urban Arboretum
Purchase St
Northern Ave
WA Chair
0.95 mile away
Federal Reserve Plaza Park
Boston South
Congress St
Boston Children's Museum


LIST
WA Chair
WA Chair
Team
About the Bench
Photos
Video


BENCH
WA Chair

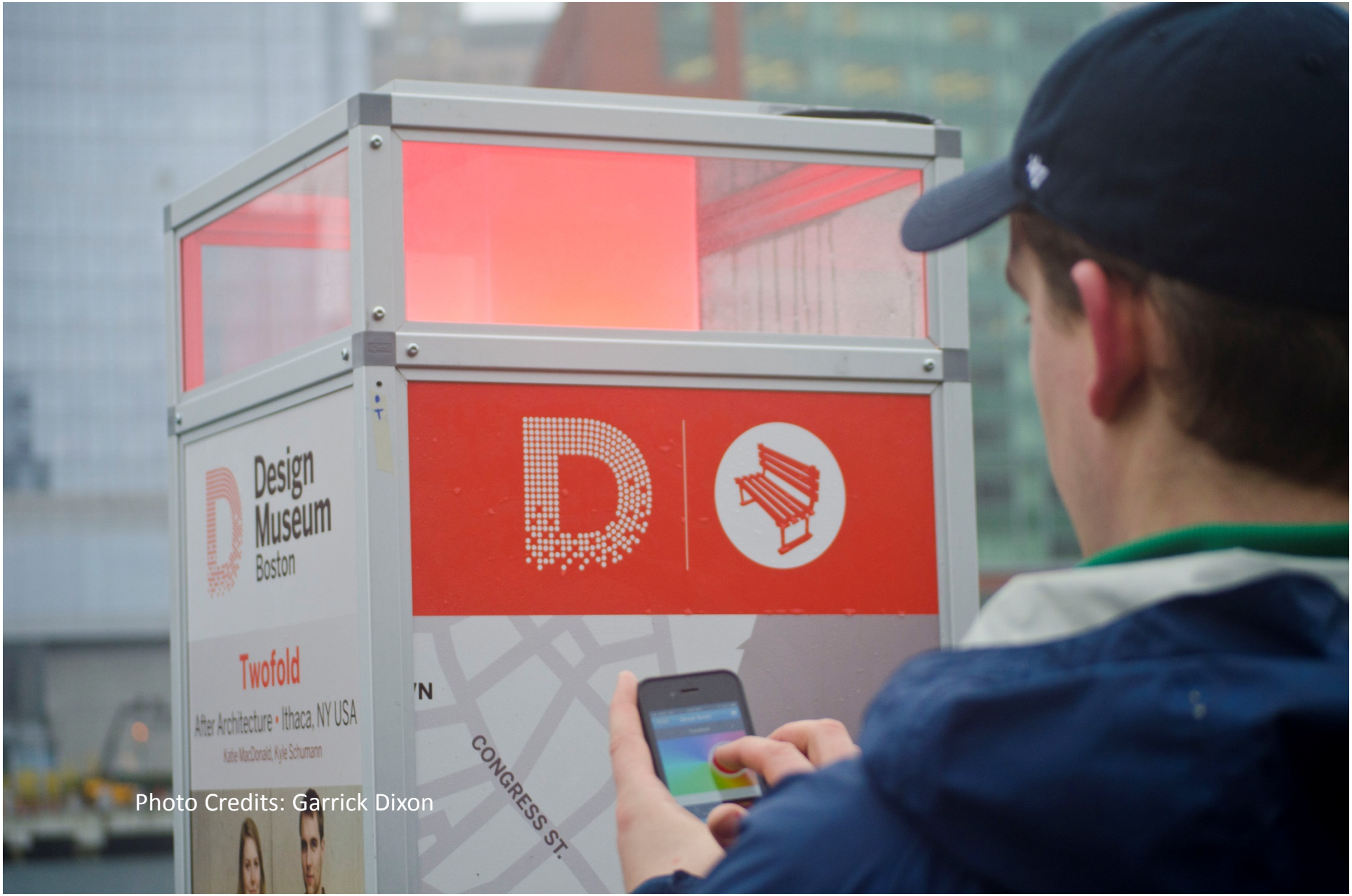
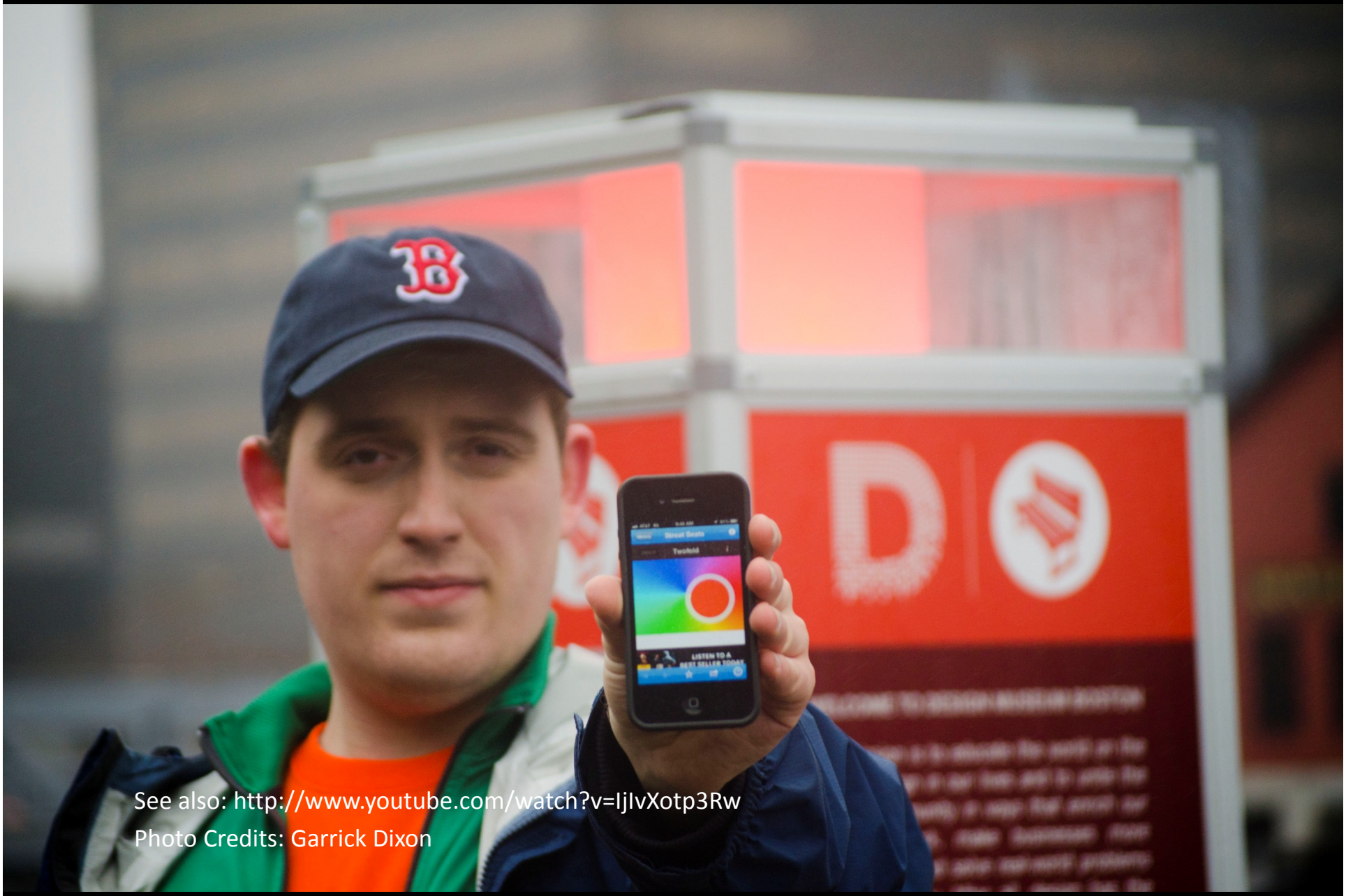


Photo Credits: Garrick Dixon



See also: http://www.youtube.com/watch?v=IjIvXotp3Rw

Photo Credits: Garrick Dixon

Digital ground and getting into place…

Digital ground is shorthand for a complex proposition: Interaction design must serve the basic human need for getting into place. Like architecture, and increasingly as a part of architecture, interaction design affects how each of us inhabits the physical world.

(McCullough, 2004, p. 172)

PHILIPS
Susanne Seitinger, PhD
City Innovations Manager
Tel +1 781 418 9259
Main +1 888 385 5742
Mobile +1 781 460 7059
Susanne.Seitinger@philips.com
3 Burlington Woods Drive
Burlington, Massachusetts 01803 USA
www.philipscolorkinetics.com
PHILIPS
COLOR KINETICS