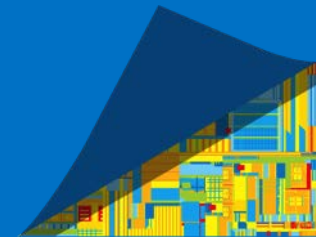
Intel Labs Media Day 2013

Imagining the Future and Building It



Intel Labs Media Day

Envisioned@Intel Labs Speakers

Steve Brown
Intel Chief Evangelist and Futurist

Lama Nachman
Principal Engineer

Ravi Iyer
Director and Senior Principal Engineer

Tony Salvador
Director and Senior Principal Engineer

Brian David Johnson
Futurist and Principal Engineer

Welcome

Steve Brown

Intel Chief Evangelist and Futurist
Intel Labs, Intel Corporation

Intel Labs Media Day

Agenda

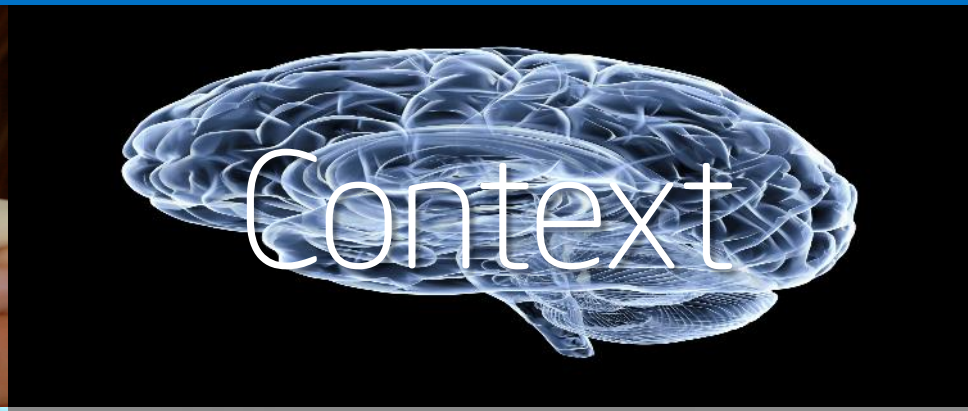
Envisioned@IL Talks	Speakers
1:00pm – 1:15pm:	Steve Brown
1:15pm – 1:30pm:	Lama Nachman
1:30pm – 1:45pm:	Ravi Iyer
1:45pm – 2:00pm:	Tony Salvador
2:00pm – 2:15pm:	Brian David Johnson
2:15pm – 2:45pm:	Speaker Panel (Steve Brown – Moderator)
2:45pm – 3:30pm:	Coffee/Tea/Beverage & Interviews


Futurist

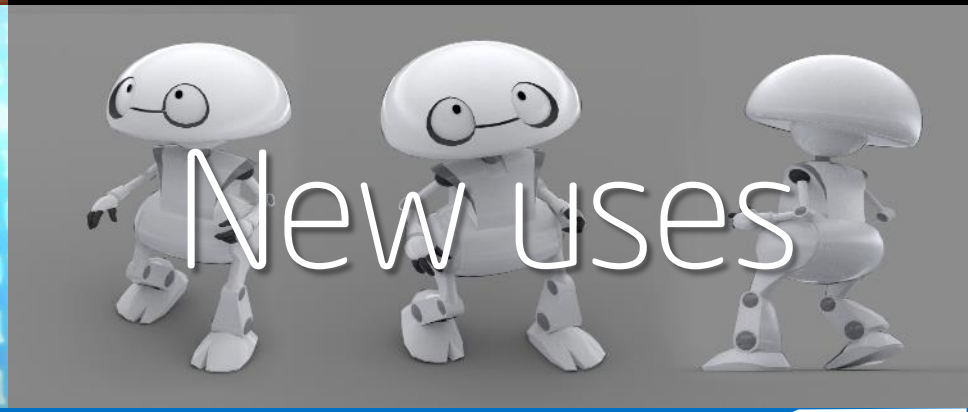
Computing is becoming

More Personal


Power


Context


Data


New uses

2 + 2 = 

Computing transforms

Objects
Industries
Societies

Media and publishing

D.T.P

Video editing

Animation

Consumption

Multimedia

SFX

Distribution

Web 2.0

Digital Storytelling

1980s 1990s 2000s 2010s 2020s

Media and publishing

Manufacturing

Transportation

Lama Nachman

Principal Engineer
Intel Labs, Intel Corporation

Context is Everything: Sense -> Understand -> Act

Fueling the Context Revolution

Integrated Sensors

Ubiquitous Sensing

Computing in your pocket

Always Connected

Data access & analytics

1st camera Phone

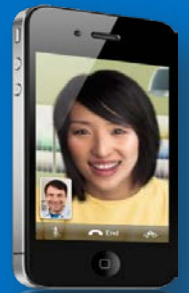
Mic
Camera

Park HD

Temp
Accel

Accel
Mic
Camera

Proximity
Cap Touch
ALS
Accel
Mic
Camera



FF Camera
Compass
Gyro
GPS
Proximity
Cap Touch
ALS
Accel
Mic
Camera

2000 2005 2010

Inferring the context : What am I doing?

HARD SENSING

In Front of Laptop

Running, Walking, Sitting, etc

Commuting, Chatting, Listening to Music, etc

Dark, Light, Indoor, Outdoor

Location (GPS, WIFI, BT)

Activity Fusion Algorithm

SOFT SENSING

Device Activity: Call, Editing, Surfing, Email

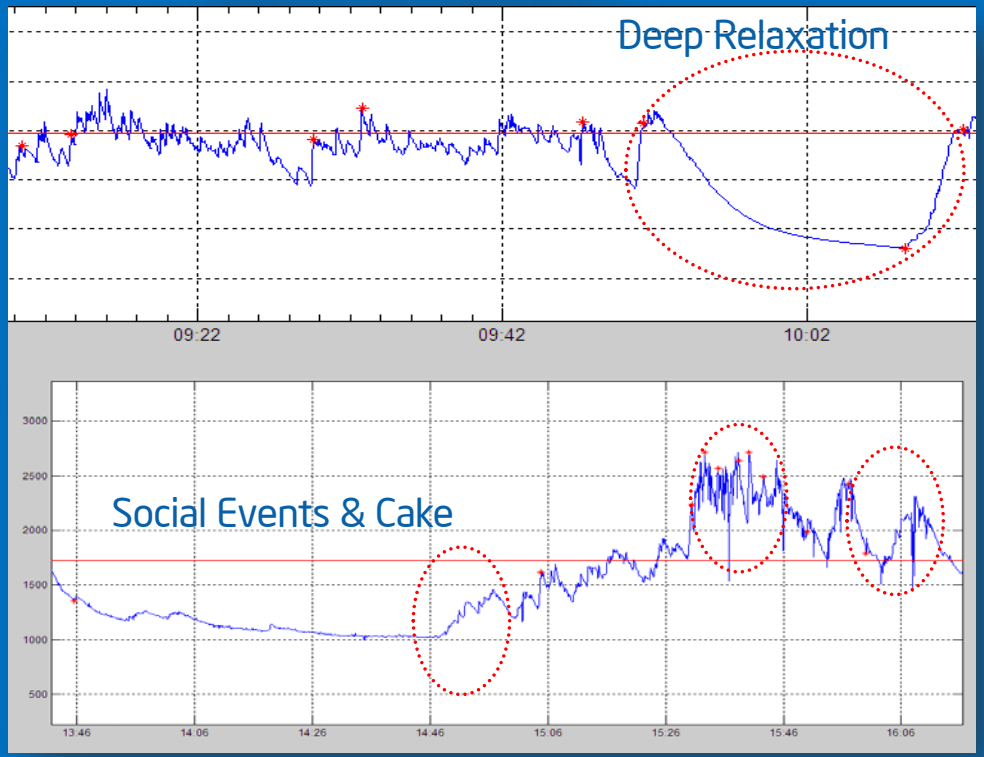
Calendar: free, In meeting, etc

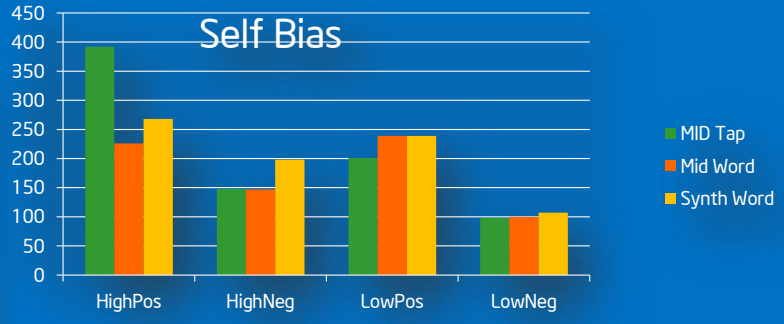
Browsing

Social Networking

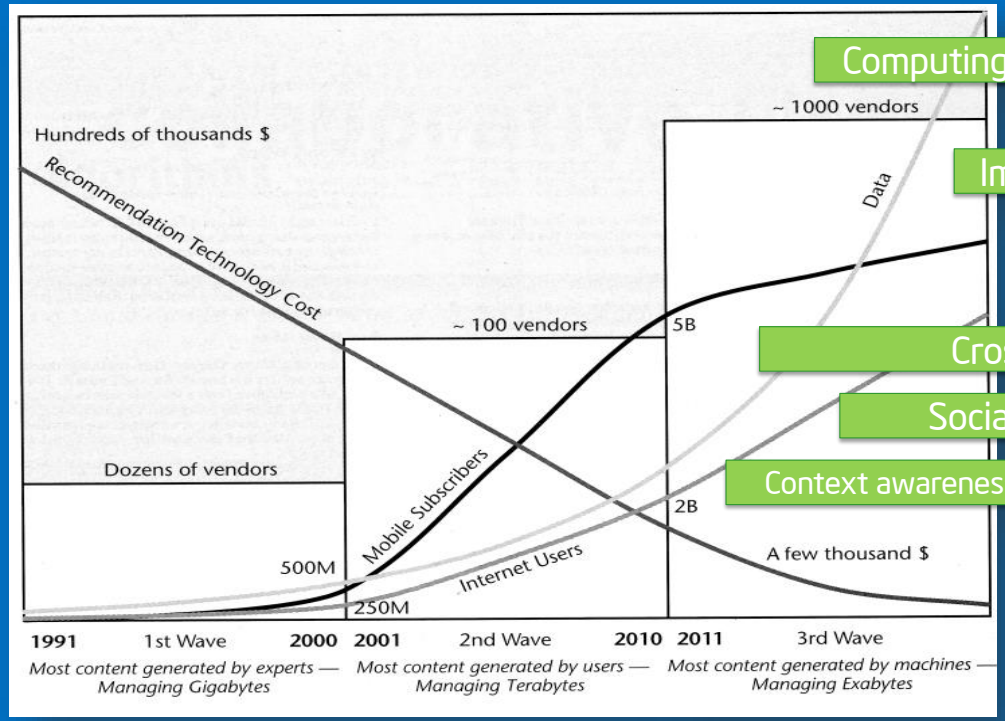
Inferring the context: How am I feeling?

Galvanic Skin Response





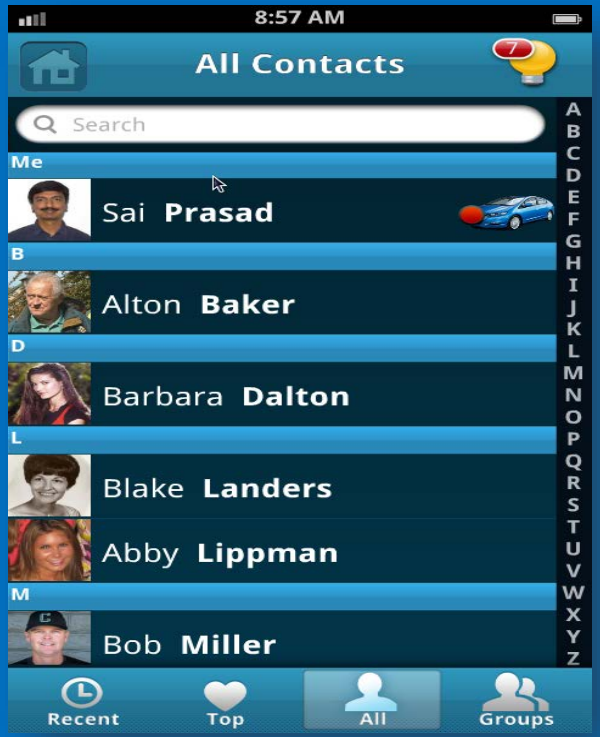
Personalization / Recommender Systems
Moving to 3rd generation and beyond

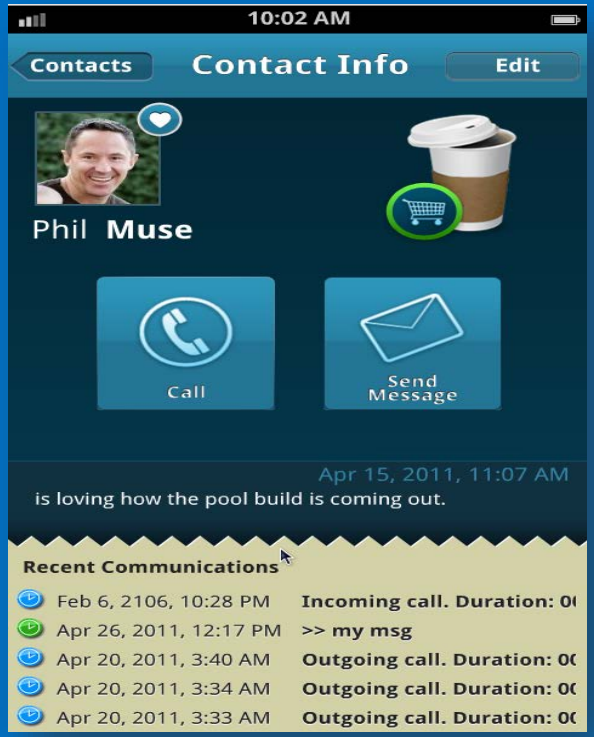


- Computing Paradigm
- Improve Transparency
- User's long term goals
- Cross Domain
- Social Network
- Context awareness
- Exploratory and Serendipity
- Unstructured data

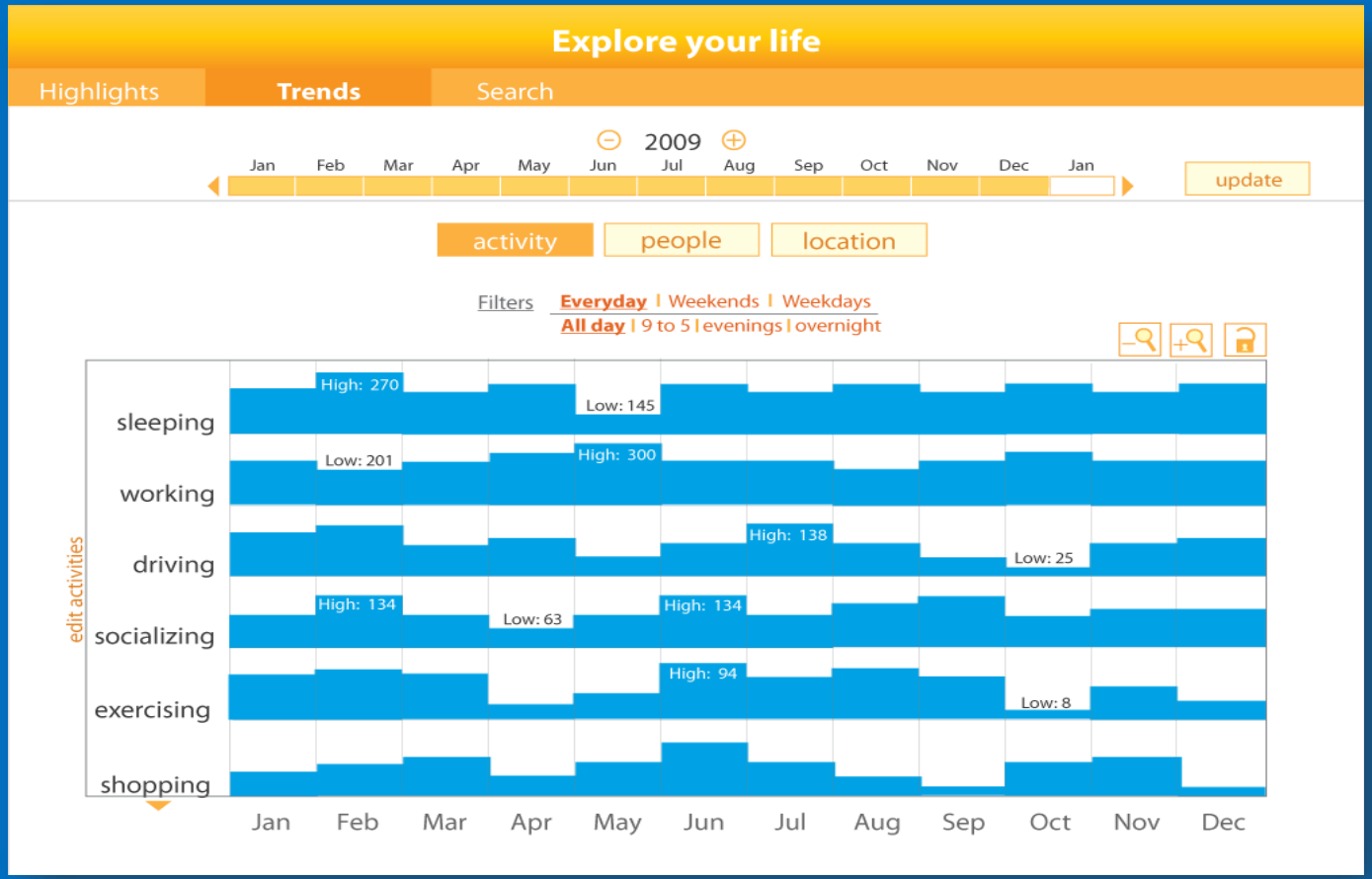
Deeper and broader understanding of user preference and improve UX

Context Aware Communication





Context Aware Introspection



Context Aware Health Coach

Context Aware Content Personalization

Multidisciplinary Approach

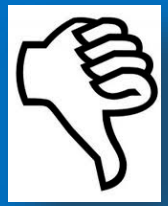
User Research

What to project?

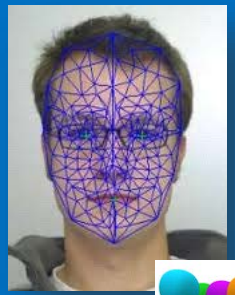
Design

Design with uncertainty in mind

Ease user Feedback



Technology



Reco accuracy

Personalization & Groups

Thank You

Ravi Iyer

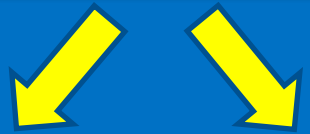
Director and Senior Principal Engineer
Intel Labs, Intel Corporation

The Future of Computing

Computing on you & around you

Natural interaction with computing

Longer Lifetime and Shrinking Form Factors



Ultra-Low Power

Ultra-Low Cost

And more compute of course ☺

Ambient Energy (No Batteries)

Ambient Understanding

Technologies for Ultra-Low Power Devices

1W → 100's mW → 1 mW → uWs

Research on cores and controllers that operate down to mWs & uWs

Research on accelerators and domain-specific IP blocks (audio, image, etc)

Research on Harvesting Ambient Energy to enable autonomous devices

Example Integrated Platform & Usage PoCs

Example

Energy Harvesting
E-Ink Display
NFC, BLE
Microcontroller
Microphone
Accelerometer

Operates at extremely low power (uWs to mWs) depending on specific usage and frequency of activity

Basic Handshake & Identity
- Energy Harvesting
- NFC
- Microcontroller

Shake Triggers for Reminders, etc
- Energy Harvesting
- Accelerometer
- Microcontroller
- E-Ink

Notification & Display Update
- Energy Harvesting
- NFC/BLE
- Microcontroller
- E-Ink

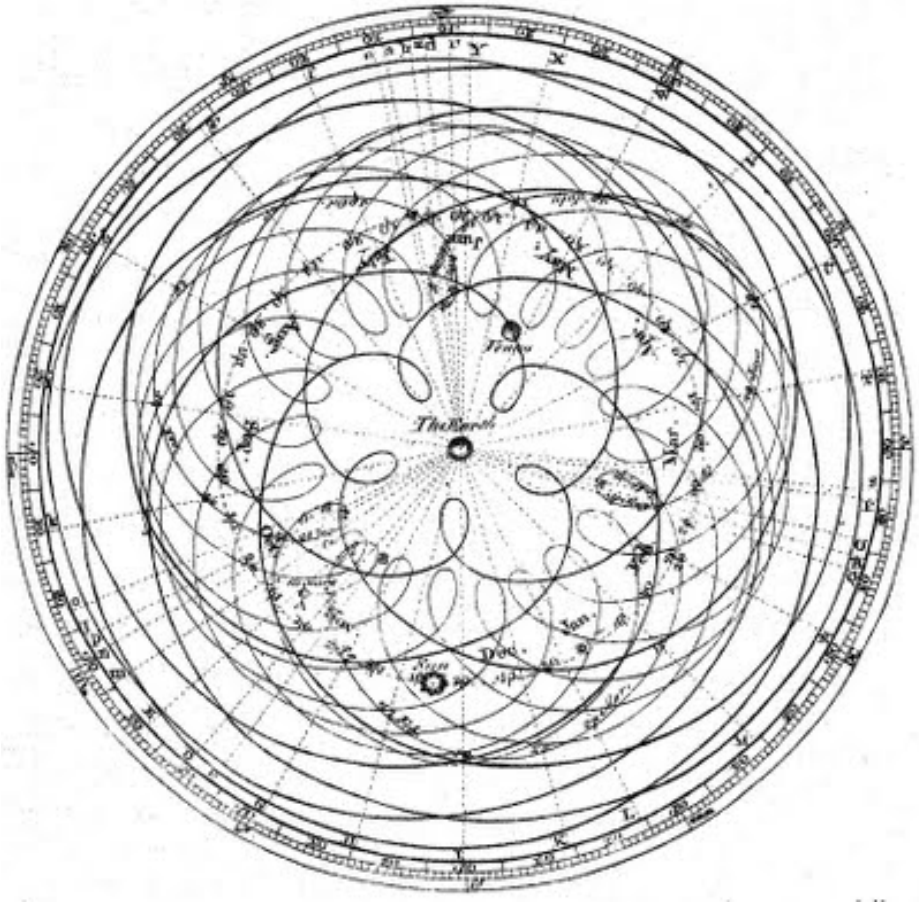
Voice Commands & Response
- Energy Harvesting
- Mic
- BLE
- Microcontroller
- E-Ink

uWs → mWs

Thank You

Tony Salvador

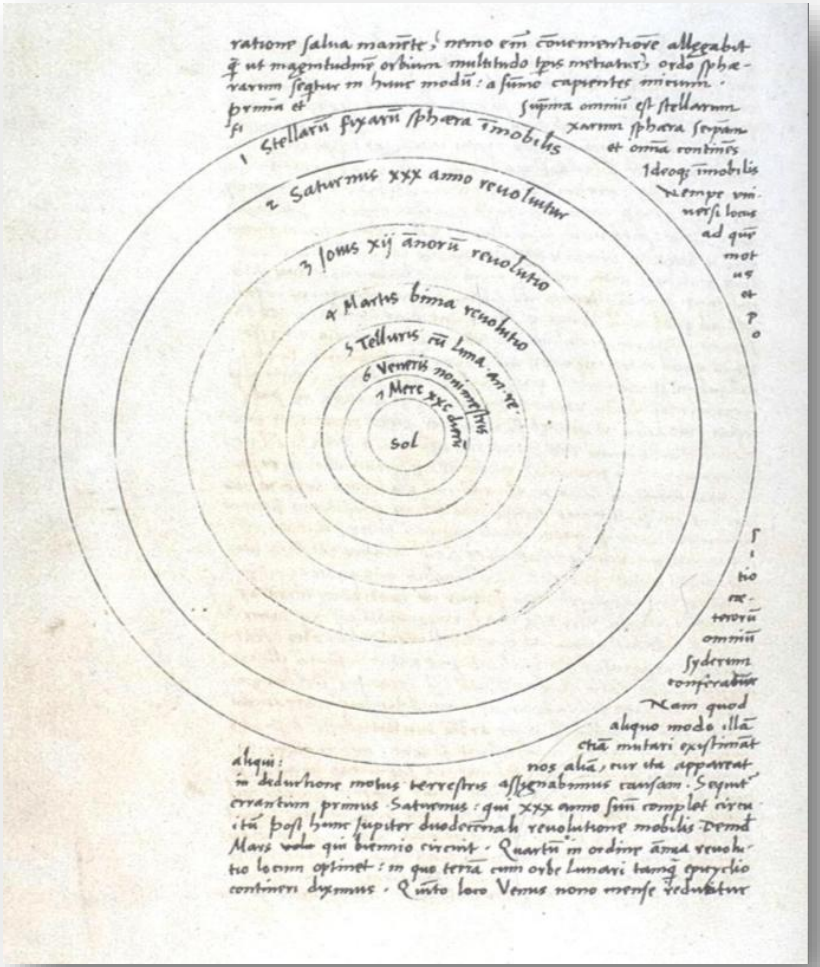
Director and Senior Principal Engineer
Intel Labs, Intel Corporation

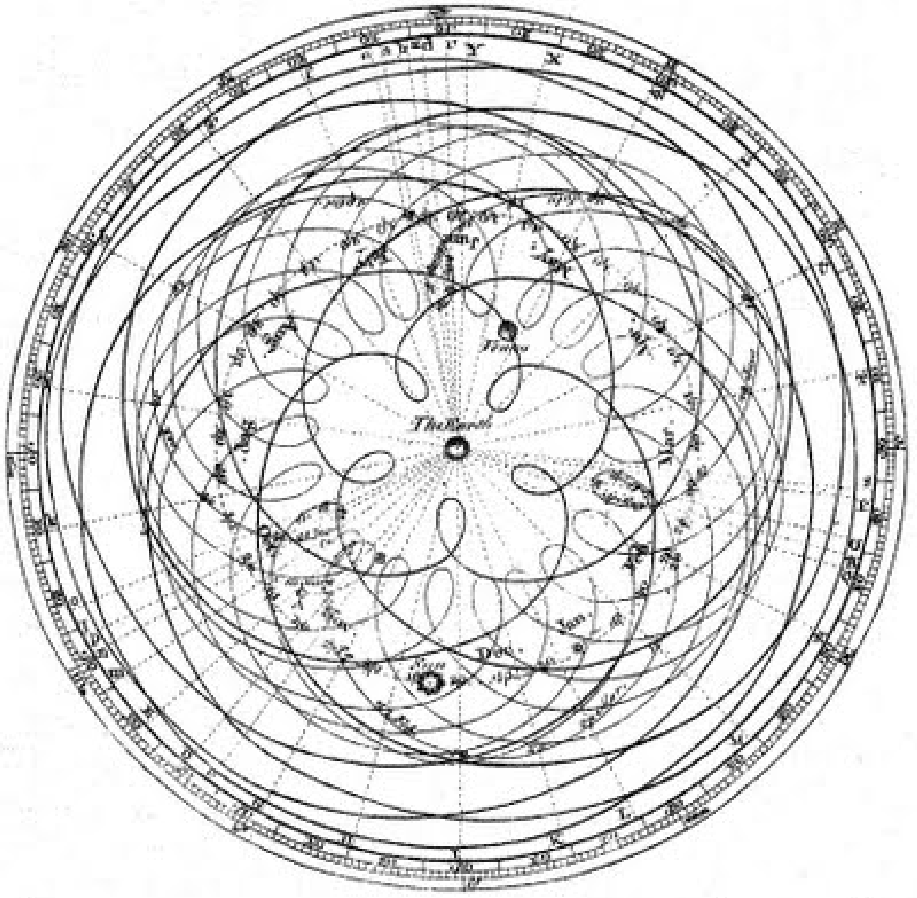


Ptolemy's geocentric model of the solar system (~150 A.D.)

Copernicus' heliocentric model of the solar system

On the Revolutions of the Heavenly Spheres (1543)




The Earth


sol

New Digital Assets

Music
Movies
Letters
Advertizing
Identity
Friendships
Conversations
Therapy
Medical
Education

Games
Money
Reputation
Dating
Credit
Banking
Knowledge
Languages
Maps
Work

Politics
Government
Voting
Journalism
Photos
Revolutions
Justice
Parking Spaces
Hotel Rooms
Legacy

Cultural Values in Flux

Accountability
Transparency
Social Participation
Ownership
Literacy
Work
Play
Conversation

Communication
Manufacturing
Reading/Publishing/Books
Science
Education
Commerce/ Exchange
Corporations
Governments
Power

Global Conditions

Digital Asset Class: Data

Engineers. A lot. Diverse.

Non-market production & Peer-based production

Commodity & combinable technologies

Connectivity galore

Networks v. linearity

#WETHEDATA

FOR THE PEOPLE, BY THE PEOPLE!

FOLLOW US

WE ARE DATA. The Arab Spring and Zipcar are part of the same data revolution. How? Right now, data may be what we intentionally share, or what is gathered about us – the product of surveillance and tracking. We are the customer, but our data are the product. How do we balance our anxiety around data with its incredible potential? How do we regain more control over what happens to our data and what is targeted at us as a result? We The Data have the power to topple dictators, or empower them. We The Data can broaden economic opportunity to new, as yet unimagined kinds of entrepreneurs, or further consolidate economic power in the hands of a few large corporations. We The Data can create new forms of social cooperation and exchange, or give us more of the same corporate obsession with better targeted advertising. It's up to us: #wethedata

Thank You

Brian David Johnson

Futurist and Principal Engineer
Intel Labs, Intel Corporation

Who am I?

Me.

Arthur.

University of Essex Robotics Lab

Who am I?

Me.

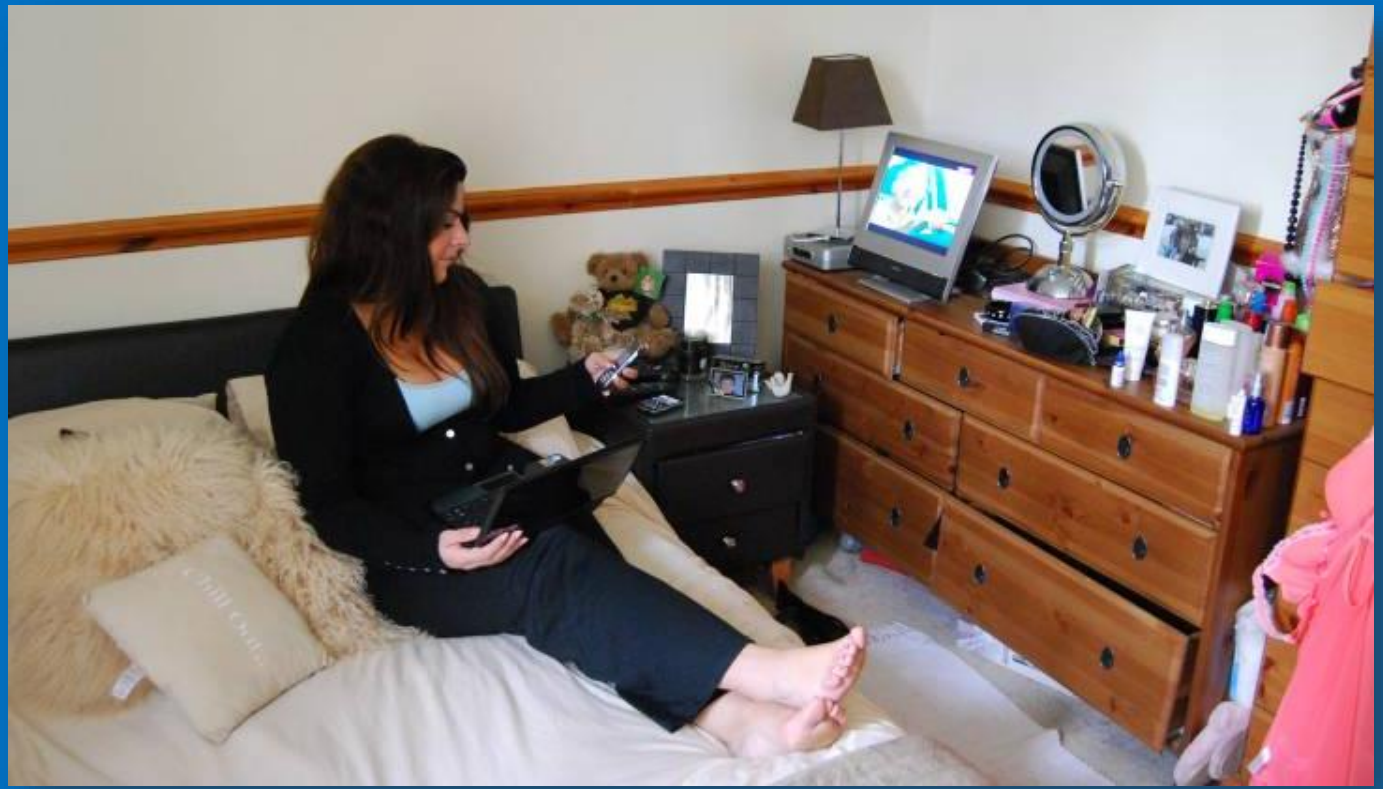
I am a geek.

Arthur.

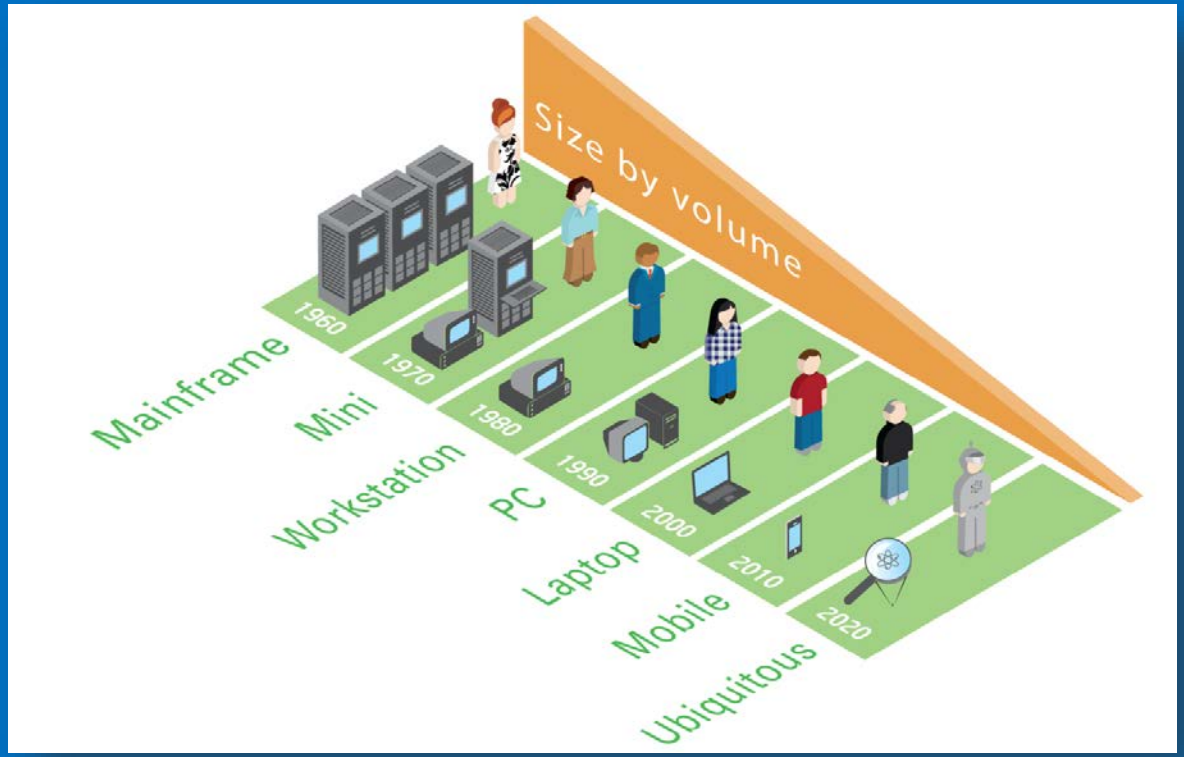
University of Essex Robotics Lab

What will the future look like?

What will the future look like?



2020: Computer Approaches Zero



Which is more intelligent?

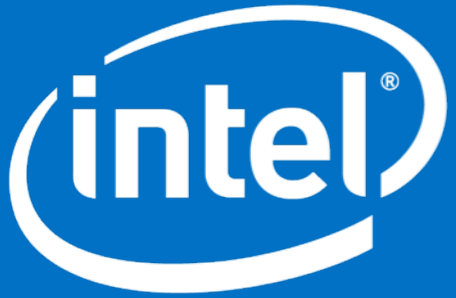
vs.

How do we change the Future?

How do we change the Future?

Change the story people tell themselves about the future they will live in.

Thank You


intel

Steve Brown
Intel Chief Evangelist and Futurist

As Intel's Chief Evangelist, Steve is responsible for building and articulating a clear vision for the future of computing and the exciting experiences that it will enable in the next decade and beyond. As a futurist, he synthesizes social, technological, demographic, market, and economic trends and consults with industry experts to understand how technology will shape the future of all the major vertical industries, including retail, healthcare, manufacturing, education, transportation, energy, and more. Steve then engages people in a positive, actionable conversation about the future. He brings Intel's vision to life through inspiring talks, painting a picture that helps people understand the profound impact computing will have on our lives.

As a senior technologist within Intel Labs—a small army of researchers that are busy shaping the future of everything from transportation and healthcare, to retail and wearable computers—Steve has wide and deep knowledge of Intel's business, products and technologies. He acts as a consultant on Intel strategy and also offers storytelling and other communications coaching to Intel executives.

Steve joined Intel in 1985 and holds bachelors and masters degrees in Microelectronic Systems Engineering from Manchester University. Steve is passionate about technology, and what it can do for people. He has held a variety of roles spanning engineering, business, sales, marketing, events, manufacturing, and communications. He was born in Britain, became a US citizen in 2008, and lives in downtown Portland, Oregon.

Lama Nachman

Principal Engineer
Intel Labs, Intel Corporation

Enriching Lives: Creating a better life

While we call our phones smart phones today, there isn't much about them that is "smart". Our devices don't seem to know more about us years after living with them than the first day we met them. To enable our devices to take more liberty and act on our behalf, it needs to understand our context otherwise we run the risk of reinventing clippy.. This talk will be focused on context-aware computing, what we can infer automatically from sensors embedded in the platform, how we do it and how it can enable compelling experiences.

Lama Nachman
Principal Engineer

Lama Nachman is a Principal Engineer in Intel Labs Interaction and Experience Research. Her current research is focused on creating contextually aware experiences that understand users through sensing and sense making and act on that context to help with many aspects of their lives. Lama has 16 years of experience in the areas of computer architecture, context aware computing, multi-modal adaptive interfaces, embedded systems, wireless technologies and sensor networks. Previous assignments at Intel involved researching and developing the next generation of self-organizing sensor network nodes (Intel Mote Platforms). Lama has pioneered deployments of these technologies in health applications as well as various commercial and industrial settings. Other major achievements include the development and performance evaluation of microarchitecture components for the Itanium® 2 processor family. Prior to joining Intel, Lama has held senior positions at Ubicom Inc., Weave Innovations and Microsoft Corporation. Lama received her MS and BS in computer engineering at the University of Wisconsin-Madison.

Ravi Iyer

Director and Senior Principal Engineer
Intel Labs, Intel Corporation

Ultra-Low Power Technologies for Future Computing

As future computing devices get smaller and richer at the same time, there is a need for developing innovative technologies that runs efficiently at extremely low power and cost. The landscape of computing is changing radically and Intel Labs research is delivering efficient solutions to address this new trend. This talk will provide examples of HW/SW technologies to enable a new future.

Ravi Iyer
Director and Senior Principal Engineer

Ravi Iyer is a Senior Principal Engineer and Director of the SoC Platform Architecture group in Intel Labs. He leads research on ultra-low power SoCs, accelerators and technologies for future computing devices and platforms. Ravi is also the Managing Sponsor for two world-class research centers: the Intel Science and Technology Center for Embedded Computing (ISTC-EC) at Carnegie Mellon University and the Intel Collaborative Research Institute for Computational Intelligence (ICRI-CI) in Israel. Ravi has published 150+ technical papers and has 50+ patent applications pending. Ravi received his Ph.D. in Computer Science and has been with Intel for 14+ years.

Tony Salvador

Director and Senior Principal Engineer
Intel Labs, Intel Corporation

The Data Economy: Unlocking the hidden value of data for everyone

Data is becoming a fundamental driver for the high-tech economy and likewise can empower individuals, providing personal intelligence to help people connect with others, digitally exchange value, and draw insights which help them get more out of life. Intel Labs envisions a future where personal & open public data sources work on your behalf – actively exchanging and analyzing data in a way that you can trust. Intel Labs' Data Economy initiative drives research into new user experiences, technologies, and business models to give people the means to control their data, analyze it, exchange it, and freely relate it with other data – all on their own terms. Learn more about the cultural and technical trends at play and what Intel is doing to foster the growth of a new data society.

Tony Salvador
Director and Senior Principal Engineer

Dr. Tony Salvador, Senior Principal Engineer, currently directs research in the Experience Insights Lab within Intel Corporation. His team's role is to identify new, strategic opportunities for technology based on an understanding of fluctuating, global socio-cultural values. Tony leads a team of social scientists and business analysts to look for, find and develop viable opportunities to create local, sustainable value with new high tech products, services and infrastructures. His ongoing research interests concern disruptive innovation practice, development and new market creation with an ethnographic perspective.

Previously, he directed research for the Emerging Markets Platforms Group and was instrumental in the research and design of the Intel powered classmate PC. Prior to that he was a research scientist and co-founder of Intel's People & Practices Group. Tony received his bachelor's degree in Experimental Psychology from Franklin & Marshall College in Lancaster, Pennsylvania. He earned a Ph.D. in Human Factors and Experimental Psychology at Tufts University in Boston. He has over 50 published papers and patents in academic journals as well as more popular venues.

Brian David Johnson

Futurist and Principal Engineer
Intel Labs, Intel Corporation

How to Change the Future: Intelligent spaces, places and just about everything

As we approach the year 2020 the size of meaningful computational power begins to approach zero. That means the size of the intelligence in a chip reaches 14nm or even 5nm. That's 12 atom across!

What this means is that we can turn anything into a computer. If we can turn anything into a computer it means that we will be surrounded by computational power. We now need to ask ourselves a radically different question about the technology that we build. For decades we asked ourselves *can* we do it. Can we make a desktop small enough to fit on someone's lap. Can we make a laptop small enough to fit in someone's pocket. But now we need to ask ourselves *what*. What do we want to do? What effect do we want to have? Where do we want to live? And how will it affect the lives of people? Can we use all of this intelligence to make the loves of people better?

Brian David Johnson
Futurist and Principal Engineer

The future is Brian David Johnson's business. As a futurist at Intel Corporation, his charter is to develop an actionable 10 -15 year vision for the future of technology. His work is called "future casting"—using ethnographic field studies, technology research, trend data, and even science fiction to provide Intel with a pragmatic vision of consumers and computing. Along with reinventing TV, Johnson has been pioneering development in artificial intelligence, robotics, and using science fiction as a design tool. He speaks and writes extensively about future technologies in articles and scientific papers as well as science fiction short stories and novels (Science Fiction Prototyping: Designing the Future with Science Fiction; Screen Future: The Future of Entertainment Computing and the Devices we Love; Vintage Tomorrows: A Historian and A Futurist Journey Through Steampunk Into the Future of Technology; Fake Plastic Love; Nebulous Mechanisms: The Dr. Simon Egerton Stories; the forthcoming Wizards and Robots comic book). He has directed two feature films and is an illustrator and commissioned painter.

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