

A black and white photograph of a modern, multi-story building with a large glass facade. The building has a curved section on the right side where the IBM logo is visible. In the foreground, there is a grassy area with a few trees and a paved walkway. Several people are walking on the path. The overall scene is well-lit, suggesting daytime.

# IBM Research – Haifa – EU Activities

Dr. David Bernstein  
Program Manager of EU Collaboration  
IBM Research - Haifa

# IBM Research: A global engine for innovation



- 12 labs
- In its 70th year
- 23rd year of patent leadership



# IBM Research – Haifa at a Glance

Established in 1972

IBM's largest Research facility outside the US

Spanning all IBM Research strategy areas

Working with IBM business units and IBM clients worldwide

Collaborating with academia and industry

About 100 patents / year



# The Unique R&D Environment of Israel

## Top world class universities:

- Technion, Hebrew University, Weizmann (Nobel prizes and Turing awards)
- Highest publications / capita

Academia



Industry



VC



## “Start-up Nation”

- ~5000 start-ups (estimate)
- VC investments: 2012 - \$1.95, 2013 - \$2.3B, 2104 - \$3.4B, **2015 - \$4.43B**
- 2015 Israeli hi-tech exits: \$9.2B
  - M&A - \$8.4B; IPOs - \$0.61B

- ~13,000 technology companies
- ~100 Israeli companies listed in NASDAQ – the second largest non-US country (after Canada)
- Over 80 Fortune 500 **global corporations** conduct leading edge R&D (IBM, Cisco, GE, Motorola, Philips, TI, SAP, EMC, ...) in particular:
  - **Intel**'s second largest design center; low power and wireless missions - in Israel
  - **Microsoft** R&D center
  - **HP**'s second largest R&D (due to acquisitions); a research center in the Technion
  - **Apple** – new (2014) R&D in Haifa (in addition to 2 acquisitions: Anobit and PrimeSense)
  - **Google** - R&D center, **Yahoo!** Research center, **Facebook** to started R&D (due to acquisitions)
- Israeli based leading companies: Checkpoint, Mellanox/EZchip, Amdocs, Comverse, Nice, Orbotech,

# IBM in Israel

IBM Research Lab



Leading in cognitive computing, cloud storage, healthcare, multimedia analytics, and IoT

System and Storage



Leading edge storage technology

Software Development



Global leadership in SW development for mobile, Big Data, collaboration and application security

IBM Israel



IBM has been pioneering hi tech in Israel since 1949

# Haifa's Focus Areas



Quality



Debating  
Technologies



Mobile



Social Analytics



Video  
Analytics



Wearable /  
IoT



Health /  
Wellness



mmWaves



Security



Cloud Data Store Services  
& Platform as a Service

# Cybersecurity for Connected Cars

420M

Automobiles will be  
connected by 2018



100M

Lines of code in a  
typical car



Inter and Intra-  
vehicle safety is  
more vital than ever



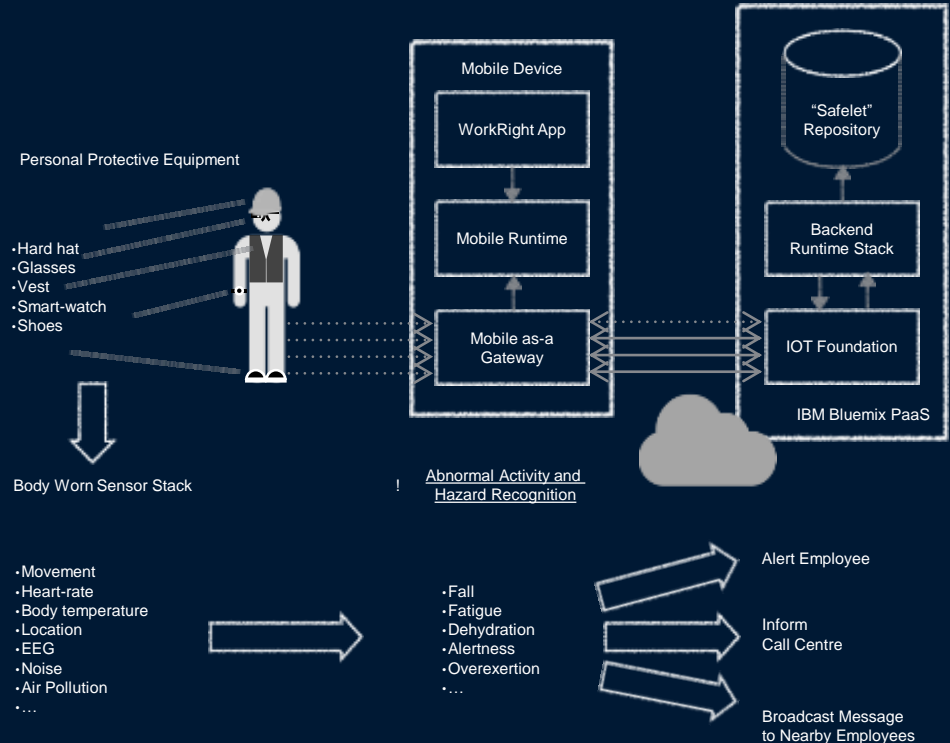
IBM cybersecurity researchers in Israel are developing protection for connected cars by providing cloud-based intelligence to identify cyberattacks and suspicious activity that can endanger the car or its occupants.

# IoT and Employee Safety

IoT platform and Wearable Computing delivering a personal 'Guardian Angel'



**317 million**  
non-fatal occupational accidents  
per year globally





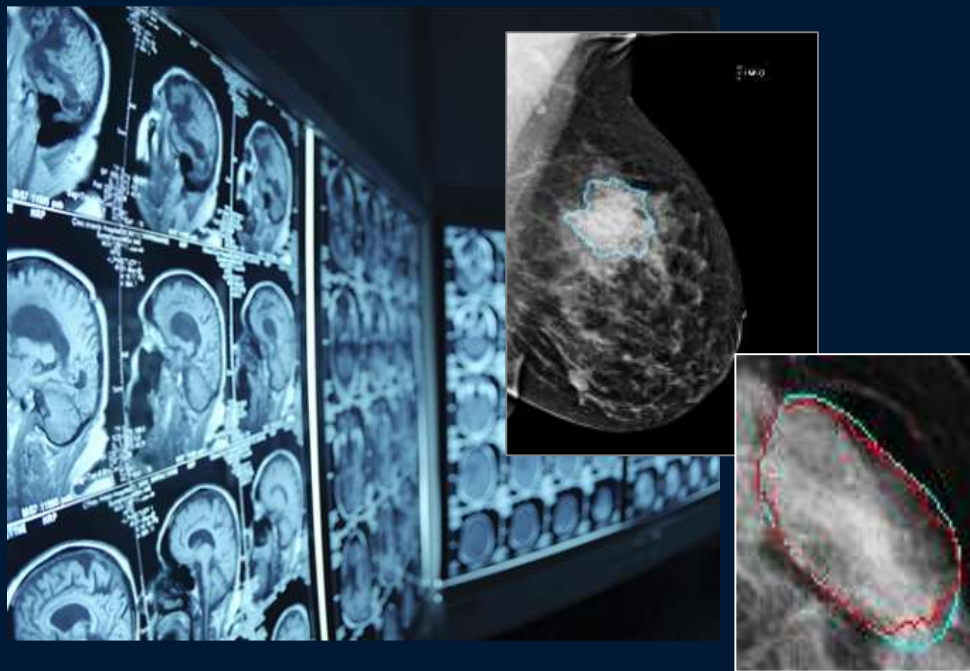
# Medical Sieve - Cognitive Radiology Assistant

200 cases

Typically examined per  
day by radiologists

10 - 30%

Error rate by radiologists  
in detecting breast cancer  
from screening



Tumor detection and classification



# Cognitive Computing: Debating Technologies

Example: generating **claims**  
or a given **topic**

**4M**

articles in Wikipedia



**100B**

candidate claims



**10**

relevant claims



# EU Partnerships

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- Collaborative innovation - partners sharing their knowledge
- Extensive portfolio of collaborations
  - Over **200 European universities**
  - Of a total **600 partners** (in FP7)
- Large momentum for Horizon 2020
  - **13 new projects** focusing on cloud, analytics, mobile, security, and social analytics



# IBM Haifa – FP7 & H2020 Projects (I)

## Cloud

- FIWARE/FICORE – Open source cloud platform
- BEACON – Enabling federated cloud networking
- IOSTACK – Software defined storage for Big Data
- OPERA – Power heterogeneous cloud architecture for industrial applications
- MIKELANGELO – Micro kernel virtualization for high performance cloud systems

## Software Quality and Verification

- CloudWave – Agile service engineering for Future Internet
- IMMORTAL – Fault management and verification for reliable design environment
- RePhrase – Refactoring parallel resource-aware applications
- SmartResilience – Smart resilience indicators for critical infrastructures

# IBM Haifa – FP7 & H2020 Portfolio (II)

## **Security and Privacy**

- PrismaCloud – Privacy and Security for cloud services
- SHARCS – Secure architecture for robust computing system
- SUNFISH – Secure information sharing in federated private clouds
- OPERA – Power heterogeneous cloud architecture for industrial applications



Questions?

