ON 1/10/2016 IMEC AND IMINDS HAVE MERGED

embracing a better life
ON THE MENU

- Overview of imec “Smart Applications and innovation services”
- Collaboration options
  - imec.icon
  - imec.istart
  - Bilateral contracts
- Services
  - Living Labs
  - Prototyping
- Innovation platforms
  - City of Things
  - Krook
SMART APPLICATIONS – RESEARCH PROGRAMS

DATA SCIENCE

DISTRIBUTED TRUST

EVERYTHING CONNECTED
SECURITY FOR IoT CONSTRAINED DEVICES

- Lowest power Elliptic Curve Cryptography
- Secure SW framework & HW/SW co-design
- Proximity as secured authentication service
DISTRIBUTED MACHINE LEARNING FOR REAL-TIME APPLICATIONS
DIANNE TECHNOLOGY

- Real-time execution by the AI-enabled point
- Knowledge base & Deep learning in the Cloud
- Push new samples to experience pool
- Get optimized NN training results
COLLABORATION OPTIONS
IMEC.ICON: R&D COOPERATION WITH FLEMISH INDUSTRY
IMEC.ICON INFO SESSION

- Next Friday, Dec 2nd
- Brussels, Royal Library of Belgium
- 10am
- Register via bit.ly/iconinfo2017-1
IMEC.ISTART: THE DIGITAL SEED INCUBATOR FOR FLANDERS

IMEC.ISTART submissions & selections

€1 iMinds → €7.5 follow-up investments

* First 6 months of 2016
IMEC.ISTART
SUBSET OF PORTFOLIO COMPANIES WITH + €1M FOLLOW-UP INVESTMENTS

More info: https://www.iminds.be/istart
Next call deadline: 09/02/2017
BILATERAL PROJECTS

- Custom contracts
- Services based on combined offering of
  - Living Lab
  - Software development
  - Hardware development
WORK IN PROGRESS: IMEC SW/HW PROTOTYPING OFFERING

USER RESEARCH & BUSINESS MODELING (LIVING LAB)
- TRENDS & TECHNOLOGY
- IDEA
- APPLICATION CONCEPT
- PROTOTYPE USER EVALUATION

SOFTWARE DEVELOPMENT
- SW PoC
- SW CONCEPT
- SW DESIGN
- SW PROTOTYPE

HARDWARE DEVELOPMENT
- HW PoC
- HW CONCEPT
- HW DESIGN
- HW PROTOTYPE
- HW PRODUCT INDUSTRIALIZED
- HW PRODUCT PRODUCTION
FOCUS ON

- One stop shop approach
- Objectivity
- Learning effects => white box prototyping
- Bridging the gap between research and implementation
SERVICES
LIVING LABS
IMPROVE DIGITAL INNOVATIONS BY ACTIVELY INVOLVING USERS & STAKEHOLDERS THROUGH CO-CREATION & REAL-LIFE INTERVENTION
IMPROVE DIGITAL INNOVATIONS BY ACTIVELY INVOLVING USERS & STAKEHOLDERS THROUGH CO-CREATION & REAL-LIFE

- MULTI-STAKEHOLDER
- ITERATIONS OF DESIGN CYCLES
- OUTSIDE OF CONTROLLED LAB

EMPOWERING USERS TO IMPACT THE INNOVATION PROCESS
LIVING LAB SERVICE OFFERING

- TRENDS & TECHNOLOGY
- IDEA
- CONCEPT
- PoC
- PROTOTYPE
- PRODUCT
- BUSINESS

- EXPLORATION
  - EXPLORING OPPORTUNITIES
- EXPERIMENTATION
  - TESTING SCENARIOS
- CUSTOMER INSIGHT & COCREATED CONCEPT
- PROTOTYPES
- VALIDATED GO2M & ROADMAP

- NEW BUSINESS
- PRODUCT REDESIGN
- GROWTH
The product is available on the market.

Initial product is aborted, but a new product idea roadmap is initiated.

Product development is discontinued or will not go to market in its current form.

The product is still under development but expected to go to market soon.
LIVING LAB STRATEGY

- HOW TO SET UP YOUR OWN LIVING LAB ACTIVITIES – STRATEGY DEFINITION
- BRAINPORT EINDHOVEN, CARE LIVING LABS

LIVING LAB BOOTCAMP

- SELECT & DEVELOP IDEAS AND IMPROVE ENTREPRENEURIAL SKILLS THROUGH A WEEK-LONG LIVING LAB TRACK
- FLEMISCH GOVERNMENT
LLAVA MATRIX

Set priorities, manage & track progress.
LIVING LAB & DESIGN THINKING TOOLS

**Thinking aloud protocol**
A test method used to gather insights into the experiences, ideas and reasonings people have when executing a task or solving a problem.

**A/B-testing**
A comparative usability test method to determine the more efficient of two interfaces.

**Cognitive walkthroughs**
A task-based usability test method used to gain insights into the reasonings people have when executing a task or solving a problem.

**Heuristic evaluation**
A usability evaluation method based on expert reviewers and a list of design guidelines (heuristics).

**Wizard of Oz**
In the Wizard of Oz the experimenter (Wizard) tests an iterative design by simulating the behavior of the intelligent application in a lab environment.

**Persona**
Fictional archetypical characters that represent your target customers.

**Value chain analysis**
A strategic management framework to achieve competitive advantage in your industry.

**Usability research**
A set of research methods to study and optimize the usability of an innovation.

**Segmentation surveys**
A survey-based method to identify customer segments based on a set of parameters.
<table>
<thead>
<tr>
<th>Year</th>
<th>Internet Connection</th>
<th>Laptop</th>
<th>Desktop</th>
<th>Game Console TV</th>
<th>Handheld Game Console</th>
<th>Tablet</th>
<th>Fixed Telephone</th>
<th>Gym</th>
<th>Smartphone</th>
<th>Wearables</th>
<th>DVB TV</th>
<th>OTT Service (incl. Smart TV &amp; other OTT)</th>
<th>Other Classic Type TV</th>
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<td>54.1%</td>
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</table>
APPLICATION PROTOTYPING
“A PROTOTYPE IS AN EARLY SAMPLE, MODEL, OR RELEASE OF A PRODUCT BUILT TO TEST A CONCEPT OR PROCESS OR TO ACT AS A THING TO BE REPLICATED OR LEARNED FROM.”

(HTTPS://EN.WIKIPEDIA.ORG/WIKI/PROTOTYPE)
FOCUS ON 2 ACTIVITIES

Prototyping

Tools for prototyping support
PROTOTYPING
<table>
<thead>
<tr>
<th>Transition</th>
<th>Prototyping service</th>
</tr>
</thead>
</table>
| Trends & technology => Idea | • Technology scoping  
• Insights on tech state of the art                                                  |
| Idea => Concept   | • Proxy technology assessment (PTA) assistance  
• Scenario development assistance by spotting technological opportunities          |
| Concept => PoC    | • Identification of critical technological unknowns  
• Agile project management coaching  
• Functional PoC development                                                        |
| PoC => Prototype  | • Architecture creation  
• Wireframes creation  
• Mockup creation  
• Functional prototype development  
• Agile project management coaching                                                  |
| Prototype => Product | • Architecture creation  
• Behavior measurement support  
• Real-time experience sampling support  
• Development coaching                                                             |
| Product => Business | • Agile project management coaching  
• DevOps consultancy                                                                |
TOOLS FOR PROTOTYPING
Measure user behavior in real time
Select panel members (test users) according to specific needs
Motivate panel member participation
Make results easy to analyse
REAL-TIME EXPERIENCE SAMPLING

REAL-TIME EXPERIENCE SAMPLING

USER EXPERIENCE SAMPLING & BEHAVIOUR CHANGE

REAL-TIME TRIGGER

PROGRAMMABLE RULE ENGINE

CONTEXT LOGGING

USER EXPERIENCE & BEHAVIOUR DASHBOARD
INNOVATION PLATFORMS
INNOVATION PLATFORMS

- City of Things
- Krook
INTERNET OF THINGS

Sensors

Radio technologies

Data services

Actuators
CAN WE IMPROVE CITIES USING INTERNET OF THINGS TECHNOLOGY?
TOP-DOWN VS BOTTOM-UP
# HOW TO MAKE A CITY “SMART”? 

<table>
<thead>
<tr>
<th><strong>Top-down</strong></th>
<th><strong>Bottom-up</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrally driven and controlled</td>
<td>Driven by citizens and companies</td>
</tr>
<tr>
<td>Efficiency is key</td>
<td>Diversity and relevancy is key</td>
</tr>
<tr>
<td>Can be too highly reliant on governmental and commercial control</td>
<td>Governmental and commercial control is optional</td>
</tr>
<tr>
<td>Privacy issues tend to surface</td>
<td>Can pose challenges in terms of economic sustainability and regulation</td>
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</tbody>
</table>
Government
Citizens
Business
Research institutes

Smart City innovation platform

SMART CITIES
PIETER BALLOW
Hoe technologie onze steden leefbaar houdt en slimmer maakt
City of Things - Antwerp

IoT reference Living Lab and technology lab in Europe

for international and local stakeholders
to create, test and validate IoT services, applications and technologies

in a large scale, real life and real time smart city environment
Co-create new IoT products and services with real prospective users.

Quickly deploy on the existing IoT testbed in the city of Antwerp.

Validate new IoT products and services in a real-world environment.

Leverage imec IoT hardware and software expertise.

Assess privacy risks of IoT products or services.

Guide Smart City IoT Business model innovation.
CITY OF THINGS
CONCEPTUAL STRUCTURE

Application Layer
(Living Labs)

Privacy, ethics, trust, security

Data Layer

Network Layer

Hardware Layer

Platform management interface
CITY OF THINGS CASES
SWITCH OFF FOR 1 - 2 MIN
LITTLE COST
MINIMAL LOSS OF COMFORT

DEMAND > SUPPLY
POWER SHORTAGE IMMINENT

TEMPORARILY DISCONNECTS
INDUSTRIAL SITES

RESIDENTIAL FOCUS:

CITY OF THINGS

SMART PLUGS
MEASURES ACTIVITY OF E-BOILER
CITY OF THINGS - VALIDATION
SWITCH OF ACTIVE E-BOILERS
REGULATION OF DEMAND

REstore
Het snelst groeiende technologiebedrijf van België is REstore


Winnaar Deloitte’s Technology Fast 50 2016, actief in Clean Technology

Voor: Nicolas Tahon (Technology Fast 50 senior) David Slikkerveer (voorzitter REstore) Reza Farniok (CEO REstore)

Winnaar Deloitte’s Technology Fast 50 2016, actief in Clean Technology

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PREVENTION
SUGGEST MEASURES
MAIN FOCUS ON NEIGHBORHOODS AT RISK

PREPARE FOR FLOODING
REDUCES WATER DAMAGE TO BUILDINGS
REDUCES LOAD ON THE FIRE DEPARTMENT
REDUCES LOAD ON EMERGENCY LINE 112

REAL-TIME MEASUREMENT OF SEWAGE WATER - LORA SENSORS

APPROPRIATE MEASURES
INTELLOCITY: LAST MILE DELIVERY

- With Vlaams Instituut voor Logistiek (VIL)
- Optimizing last mile logistics delivery through IoT track and trace
- Moving sensor infrastructure instead of fixed
- Data sent over LoRa every 10 seconds
- Data aggregation at certain locations in the city
DE KROOK
De Krook as a site – a project enhancing the city’s renewal

TRADITION
RENOVATION WINTERCIRCUS
LINK WITH VOORUIT

INNOVATION
NEW MAIN BUILDING &
PUBLIC SPACES
De KROOK
Opening March 2017

Unique ecosystem in the building
Quadruple Helix

Public Services
Stad Gent, Bibliotheek Gent, Digipolis, …

Research
UGent, IMEC, Hogescholen

Industry
Project-wise in residence (on Floor +4)
vs (Trendwolves, GentBC, GentM, VOKA, Cultuurconnect, De Vooruit, Minard, Ministry of Makers, …)

Users
+ 3000 engaged visitors daily
ANNUALLY THEMATICAL INNOVATION CYCLE

- 1st theme = virtual reality

<table>
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<tr>
<th>January</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
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<th>M11</th>
<th>M12</th>
<th>December</th>
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<tr>
<td>SERVICE OFFERING</td>
<td>Trend Monitor</td>
<td>Open Innovation Projects</td>
<td>Demo Cases &amp; Interaction</td>
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<td>ASSETS AVAILABLE</td>
<td>Scenario Analyse</td>
<td>Living Lab Services &amp; Contract research</td>
<td>Access to dedicated VR labs, user panels, experts, APIs, prototyping, sensor network, …</td>
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<td>VISIBILITY</td>
<td>Trend rapport</td>
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</tbody>
</table>
| PUBLIC EVENTS | Opening Krook Call for VR Challenges | | | | | | | | | | | | VR festival
COLLABORATIVE SITUATIONAL AUDIO

VR/AR CYCLE
tanguy.coenen@imec.be
0032 496 87 56 79