IEEE Future Directions Committee
Industry Advisory Board Report

Roberto Saracco
June 21th 2017
Outline

1) Status report
2) Comments on current Emerging Technologies List
3) Expression of Industry Interest in current/new areas
4) 5G WhitePaper
Status Report

The IAB is a subcommittee within FDC comprised of industry experts that support FDC in getting an Industry vision of the evolution and impact of technology and assessing the role that IEEE can have in the various domains.

Roberto Saracco, Head Industrial Doctoral School EIT Digital

Bernie Meyerson, IBM, Chief Innovation Officer

Brian Levy Brocade, CTO; Former CTO HP

Damir Novosel, Quanta Technology Expert, President; ABB former VP Global Product Mgt, former PES President

Dejan Milojicic, HP, Distinguished Technologist, Hewlett Packard Labs

Hideo Kuwahara, Fujitsu, Fellow Fujitsu Laboratories Ltd.

Lucy Lombardi, TIM Innovation, VP; Former Secretary GSMA

Luigi Gambardella, China-EU, President; Former President of ETNO, now Board Member

Matt Bros Compass-EOS, Chairman and CEO; Former CTO at BT and CSO at Huawei

June 21st, 2017
Status Report

- Held a joint conference call in March
- Held some 20 calls on one on one
- Involved other Industry leaders and VC in talks
- Generated a document with feedbacks on FDC Emerging Technologies
- Initiate discussion on 5G from an Industry point of view
Comments at a glance on current Emerging Technologies List

1. 3D Imaging
2. 3D Printing
3. BioFuel
4. Carbon Sequestration
5. Clean water
6. Cognitive Radio
7. Power in Mobile Systems
8. In Memory Computing
9. Micro Fluidics

10. Fog Computing and Networking
11. New OS: Rebootless OS
12. Internet of Space
13. Digital Cultural Heritage and Smart Environments
14. Reliability
15. Safety Critical Systems, Next Gen
16. Nanopore DNA Sequencing

Industry Relevance

High
Medium
Low
Comments on **3D Imaging**

- Rapid advances in the last 15 years thanks to sensors and processing power
- Fuels AR and VR
- Leading application fields: medical imaging - gaming
- Coming up: Industrial applications

- Stimulates production of devices (HMD)

- IEEE could drive Education trials based on 3D imaging
- IEEE can have a role in standardization

Comments on 3D Printing

- Rapid growth of application areas in several industries
- Will transform the logistic chain
- Leading application fields: From hobbyist to sophisticated appl.
- Coming up: becoming pervasive

- Entering a Moore’s progression, we are at the Intel 4040 level

- IEEE could steer towards libraries of models
- IEEE can flank / foster the transformation along the lines of Industry 4.0

Comments on **Cognitive Radio**

- We have reached the Shannon Limit
  The goal is to circumvent it
- Leading application fields:
  Telecommunications and users of
- Coming up: AI applied to Spectrum

- Fast evolution fueled by 5G and beyond

- IEEE shall focus on standardization
- IEEE/FDC may focus on verticals, including SAS, Smart Cities, V2V comm

http://www.marketsandmarkets.com/Market-Reports/software-defined-radio-communication-market-11265833.html
Comments on **in Memory Computing**

- The explosion of Data fuels the interest on in Memory Computing
- Leading application fields: Data analyses – SAP/HANA, IBM
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- The explosion of Data fuels the interest on in Memory Computing
- Leading application fields: Data analyses – SAP/HANA, IBM
- Coming up: Application to rebalance load between ntw core and edges
- Significant impact on Semiconductor Industry

- IEEE can steer evolution in the path of virtual silicon
- IEEE/FDC may integrate this into the Rebooting Computing Initiative
Comments on Micro Fluidics

- Rapid advance in sensor areas, bringing processing capabilities
- Leading application fields: Health care, in the broad sense
- Coming up: Labs on a chip with sensing and processing
- Significant impact on medical diagnostic

IEEE can support standardization of modules and provide library repository
IEEE/FDC may integrate different aspects, including nano 3D-printing

http://www.yole.fr/Microfluidic_Applications_Players.aspx
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Comments on **Fog Computing and Networking**

- Physiological extension of Clouds and Core to the Edges, with a twist ...
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- Coming up: Empowered Devices infrastructures based on distributed Clouds
- Significant impact on incumbent
- IEEE: move beyond academia papers, look at economics and actual implementation
- IEEE/FDC may foster integration in the 5G initiative

http://www.grandviewresearch.com/industry-analysis/fog-computing-market
Expression of Interest in Current Areas

- “Rebooting Computing”: value in fostering standardisation
- “Digital Senses”: immediate industry interest
- “5G”: looks promising
- “Symbiotic Autonomous Systems”: looks promising
Expression of Interest in new Area

- Knowledge Defined Networks
- Self Aware Networks
- Enterprise Workload in the Cloud (virtual enterprise)
- Innovation at Speed of Life
Expression of Interest in new Area – General Comments

- Proliferation of conferences is of limited interest to Industry
- Portfolio Management is crucial: flank the Future with the “here and now”
- Maintain a table of standards, industry landscape, technology roadmaps
5G – White Paper

- An “out of the Box” look from the Industry
- Stimulates a reflection on business implications at a structural level
- A tool for engaging broader constituencies
- A first “draft-draft” available to solicit comments

Ericsson 5G penetration forecast in 2022