The Bionic Man: Towards Augmented Humanity

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IDEA

- Mankind is facing a wave of hybridization
- Hybridization = augmentation / extension with artificial devices integrated in the body (incl. the mind)
  - Sensors (hearing, seeing, sensing the Internet, …)
  - Actuators (limbs, heart, gland, “immuno-cells”,…)
  - Other (memory, CPU, …)
- Nobody knows how to integrate/interface/adjust/tune these to the human recipient – example: cochlear implants
- Massive R&D needed, fundamental + applied
We learn how to **interface** all kinds of integrated devices to the human host.

We learn how to **adjust & tune** all kinds of integrated devices to the human host at deployment.

We learn how to **adapt** all kinds of integrated devices to the human host after deployment.

We obtain **carbon–silicon co-adaptation**.

Unimaginable perspectives in **Quality of Life / Health**
**IMPACT**

- **Individuals**: improved quality of life by new or regained physical and/or mental abilities
- **Industry and business**: new, booming sector (great masses want to see, hear, think, remember better, get *really* connected, etc)
- **Science**: new alliances between disciplines, S/T challenges for centuries, human-driven modus operandi
- **Philosophy**: must rethink the notion of ‘human’
- **Society**: co-adaptation, co-evolution of natural & artificial
New alliances between disciplines needed (Physiology, machine learning, Control theory, Electrical and mechanical engineering, Audiology, AI, HCI, Linguistic, Materials)

In general: medical science, computer science, material science, engineering, psychology, sociology, ...

Need new infrastructures (journals, conferences, institutes, funding schemes) grouped around human skills & abilities: e.g. “augmented vision” or “improved immune systems”

This idea is goal-driven, needs integration with enablers
Some problems have been already addressed, e.g., cochlear implants, artificial heart, limbs (e.g., OptiFox project)

This Flagship can have a well-grounded, goal-oriented start through (almost) existing hybridization devices

Flagship is sustainable and extendable by the possible next levels (interfaces, adaptation) and new extensions

Health - ICT - Engineering confluence

Current status: open for partnerships, need enablers