UBIQUITOUS INTERNET @ IIT-CNR

TOWARDS A HUMAN-CENTRIC INTERNET

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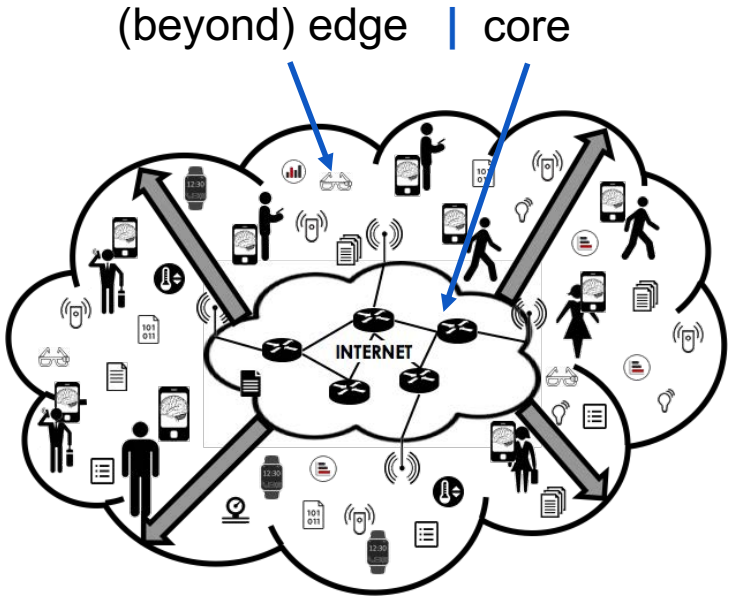
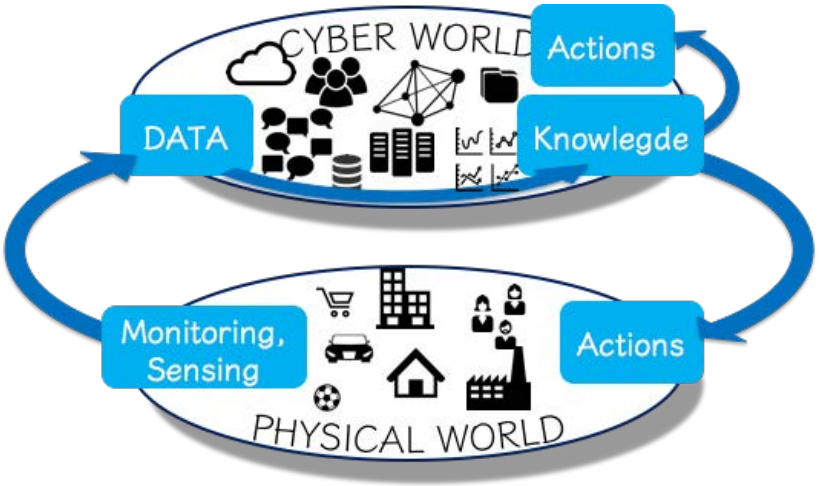
UBIQUITOUS INTERNET: VISION

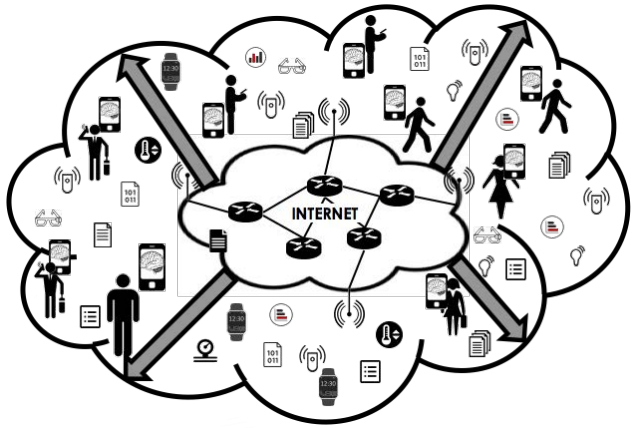
- Internet is expanding exponentially at the edge and beyond
  - ~8 billion smartphones by 2022
  - 5 IoT devices/person now, estimated 125 billions by 2030
- "Data gravity" at the edge
  - By 2025, 90 ZB produced by IoT devices alone
    out of a global datasphere (including data centres) of 175 ZB
- Cyber-physical convergence
  - We are embedded in a physical world`
    saturated by edge devices
  - Whatever we do in the Internet (cyber world)
    has an impact in the physical world and vice versa



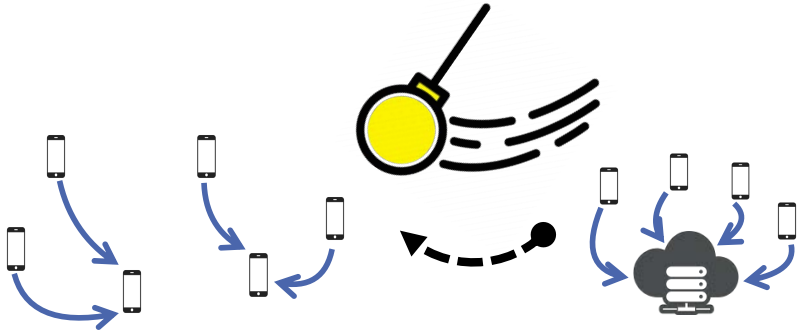


A DATA & HUMAN-CENTRIC INTERNET

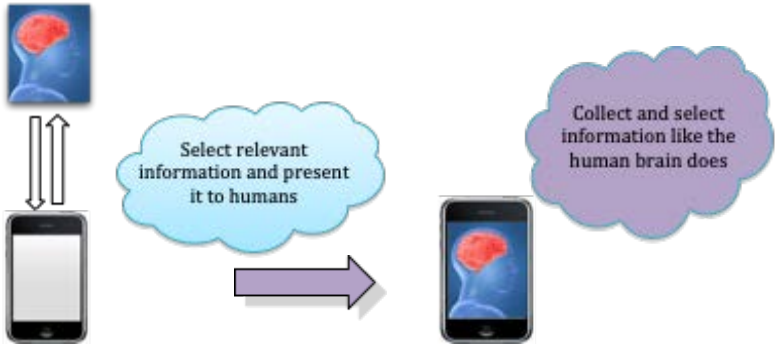
- Novel ways to see and design the Internet: data-centric
  - Not only communications, but also in-network data management, analytics, …
- Edge devices playing key roles in (new) Internet functions
  - Because of proximity with data and real-time requirements
  - Because of privacy/ownership of data
  - Because of efficiency (5G capacity argument)



- Centralised vs Distributed "pendulum" of Internet systems
  - from cloud systems to edge distributed systems



- Edge devices most of the time are personal devices
  - "proxies" of humans in the cyber world



- Ubiquitous Internet = Data- & Human-centric Internet at the edge

RESEARCH LINES (FOR MSC THESES AND PHDS)

- Distributed data analytics (AI) at the edge
  - Federated learning in edge environments
  - Distributed AI on collectives of human personal devices
  - Distributed AI for Industry 4.0 applications
- Human-centric BigData Analysis in Online Social Networks
  - Data-driven characterisation of human personal social networks in OSNs
  - Interplay between human social structures and OSN phenomena (*Information diffusion, Echo chambers, Bias in information*)
- Data-centric services at the edge
  - Composition of micro-services at users' and IoT devices
  - Distributed Ledger Technologies for mobile and IoT devices
  - Context-aware recommender systems for personal mobile devices
- Health & well-being
  - Personalised behavioural models based on heterogenous sensing data (e.g., wearable physiological sensors, activity data, nutrition, sleep)
  - AI for personalised health and mobile coaching systems
- Data-centred smart cities
  - Data-driven planning and optimisation of shared autonomous electric vehicle systems
  - Edge-assisted resource management for data-centric IoT applications in shared sensing infrastructures.

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