

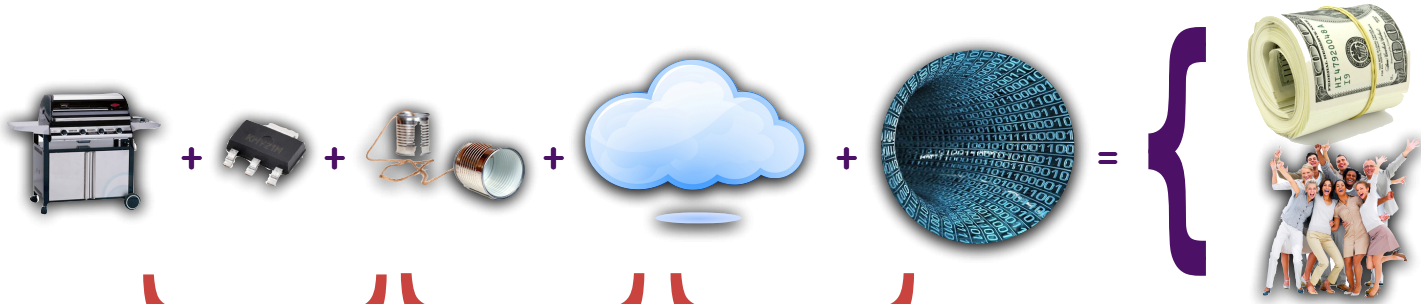
# IoE, IoT, and Computer Networking @Ecole Polytechnique



<http://www.epizeuxis.net/>

# THE COMPLETE VALUE CHAIN

In a nutshell, what we do is to enable this value-chain to exist...



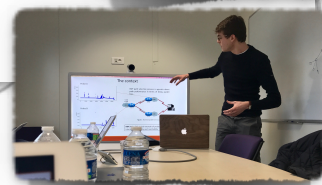
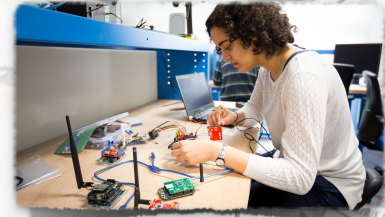
*Communication Over Non-traditional Interconnects*

*Innovative Content Distribution & Transport Architectures*

*Scalable Infrastructure As A Network Service*

# TEACHING AND TRAINING

- ▶ **Executive Education** - Internet of Things (IoT), concepteur d'un système d'objets connectés (16 days + project)
  - ▶ Academic Director: T. Clausen
  - ▶ Certification "Concepteur d'un système d'objets connectés" CNCP 1544
  - ▶ <https://exed.polytechnique.edu/en/formations/41610/internet-of-things-iot-concepteur-dun-systeme-dobjets-connectes>
- ▶ **Executive Education** - Cybersécurité (16 days)
  - ▶ Academic Directors: T. Clausen, J. Cervelle
  - ▶ Certification "Piloter une démarche de cybersécurité" CNCP 2431
  - ▶ <https://exed.polytechnique.edu/fr/formations/55004/cybersecurite>
- ▶ **Graduate Degree** - Master in Science and Technology - "IoT - Innovation & Management"
  - ▶ Academic Director: T. Clausen
  - ▶ <http://www.co4dis.fr>
- ▶ **Bachelor**
  - ▶ CS207 - "Introduction to Networks" (T. Clausen, J.A. Cordero Fuertes)
- ▶ **Cycle Polytechnicien**
  - ▶ INF471C - "Connected Objects and the Internet of Things" (T. Clausen, J.A. Cordero Fuertes)
  - ▶ INF472D - "Distributed Applications" (T. Clausen, J.A. Cordero Fuertes)
  - ▶ INF473X - "Cybersecurity - the Hacker eXperience" (T. Clausen, J.A. Cordero Fuertes, J. Yi)
  - ▶ INF557 - "From the Internet to the IoT: Fundamentals of Modern Computer Networking" (T. Clausen, P. Chassignet)
  - ▶ INF566 - "From Fundamentals to Reality: How The Internet Really Works, and How To Make It Better" (T. Clausen, **J.L. Rougier (Telecom-Paris)**)
  - ▶ INF586 - "Network Security" (T. Clausen)
  - ▶ INF567 - "Wireless Networks: from Cellular to Connected Objects" (**M. Coupechoux (Telecom-Paris)**, w/ J.A. Cordero Fuertes)



# ADVANCING SCIENCE

- ▶ Network architectures for untraditional, highly dynamic, interconnects and topologies
- ▶ Constrained Communicating Systems
  - ▶ IoT, Sensor Networks, and Smart Grids
- ▶ Post-SDN Networking: Power To The People Dataplane
  - ▶ Self-Scaling Infrastructure for Big Data
  - ▶ Data Centre Optimisation
  - ▶ Reliable and Efficient Content Distribution
- ▶ Zero-State Learning — Zero-Touch Networking
  - ▶ Hardware-Implementable Algorithms, Architectures



# AT THE SERVICE OF SOCIETY

- ▶ **Tool and Software development** - numerical analysis of network protocols, prototypes, pilots
  - ▶ **Standardisation** - IETF, IEEE, ITU, ...
  - ▶ **Contractual service** - solving (hard) problems for industry.
- ▶ **Attentive to, and a Driver Of, Application Domains**
    - ▶ IoT: Communications Architectures, Protocols
    - ▶ Ambient Networking: identification, detection, adaptive environments
    - ▶ Datacenter Networking - Optimisation
    - ▶ Content Distribution - Distributed Data Centres



# PRE-EXISTING INTRA-IPP RELATIONS

- ▶ **Historic** scientific co-production (co-authorship)
  - ▶ w/ Anis Laouiti (Telecom Sud-Paris)
  - ▶ w/ Philippe Jacquet (INRIA Saclay)
- ▶ **Recent** scientific co-production (co-authorship)
  - ▶ w/ Marceau Coupechoux (Telecom-Paris)
- ▶ **Historic** Teaching:
  - ▶ Master-ACN — T.Clausen, J.L. Rougier (Telecom-Paris)  
(Closed with the understanding that all IPP Masters were to be folded into the PhD-Track — as that isn't happening, we consider re-opening this.)
- ▶ **Current** (2020-2021) Teaching:
  - ▶ INF566 - *“From Fundamentals to Reality: How The Internet Really Works, and How To Make It Better”*  
(T. Clausen, J.L. Rougier (Telecom-Paris))
  - ▶ INF567 - *“Wireless Networks: from Cellular to Connected Objects”*  
(M. Coupechoux (Telecom-Paris), w/ J.A. Cordero Fuertes)



# IN NUMBERS ...



**24+**  
*Ratified*  
*International*  
*Standards*

**200+**  
Publications over a  
10 year period

**10+**  
Software Packages Maintained

**20+**  
Industrially Funded, bilateral research projects



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