CHIST-ERA Projects Seminar
C3N Topic

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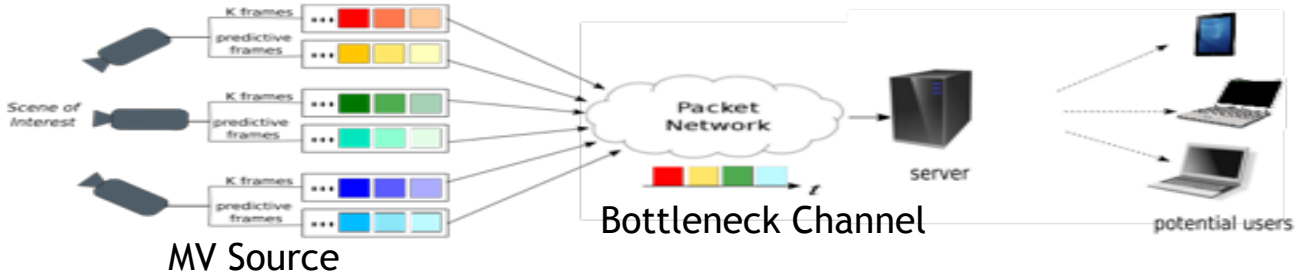
FUNDING OPPORTUNITIES from the FUTURE & EMERGING TECHNOLOGIES scheme

Context- and Content-Adaptive Communication Networks

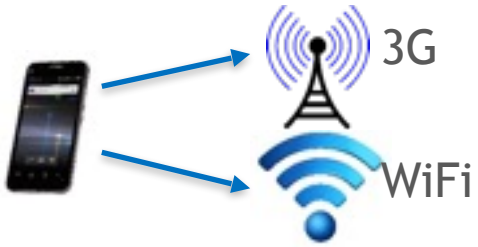
- Novel **content or service-adaptive network architectures** *rather than location-based*
- Tools and algorithms to be
  - **Network-aware**: sense network properties
  - **Context-aware**: sense usage patterns (human / social behaviors)
  - **Self-configuring** to user-related information: learning over time
- **Cross-layer and cross-player** network protocols to implement the above

C3N - Projects

- CONCERT - «Smart Communication under Uncertainty»



- MACACO - «Model & learn Content/Context for Traffic Offloading»



- DISEDAN - «Flexible and Adaptive Content Delivery» (completed)

Major outcomes and achievements

- **Fine grained understanding of human behavior (content and context)**
  - → Models for mobility and content based on real traces
    2.4 million of measurements collected
  - → MACACO content off-loading benefits:
    up to 8 MB/day/user of traffic shifted from 3G to WiFi
- **Understand, learn, and adapt to heterogeneous content and context**
  - → Models for how information spreads in a network
  - → CONCERT multi-view streaming:
    14% more accurate decisions through adaptation to learned client interactions
- **Improve end-user quality of experience**
  - → DISEDAN over-the-top video delivery system: improves QoE from 42% to 75% compared to legacy systems, for a cost of 6.3% of bandwidth overhead

Remaining challenges and needs

- **Strengths**
  - **Models** for content and context
  - **Prediction** algorithms
  - **Theoretical** evaluation and gains
- **Weaknesses**
  - **Scalability**
  - **In-the-wild** deployment and performance evaluation
- **Opportunities** - remaining challenges
  - **Incremental deployment**
  - Increasing content and application **heterogeneity** (e.g., IoT, 5G, “fog computing“)
  - Learning and leveraging players **interactions**
- **Threats**
  - Security, privacy, trust
  - Non-cooperation between content providers and Telecommunication operators

Potential sources of further funding

- ✓ Industry
  - Cooperation with telecom operators and content providers
- ✓ H2020
  - FET-Open
- ✓ National calls
  - France: ANR PRCI - French IDEX
  - UK: EPSRC - Royal Society funding

Roadmap

- In 2020: Same quality of experience as legacy TV broadcasting for e.g.
  - ✓ Web TV
  - ✓ Mobile video
- In 2025: Learning for/in autonomous smart networks, e.g.
  - ✓ Dealing with the mass of heterogeneous devices to serve
  - ✓ Dealing with the larger volume of streams (video streaming)
- In 2030: Fully personalized and rich content/service delivery, e.g.,
  - ✓ Augmented and virtual reality (AR/VR, games)
  - ✓ Tactile Internet (1ms delay constraint)
  - ✓ Immersive communication and collaboration

Questions ?