INCYP 5G: Integrated 5G and Cloud Platforms for Industrial Cyber-physical Systems

CRISTINA SECELEANU
Mälardalen University, Sweden
cristina.seceleanu@mdh.se
• 5G + Cloud services + Industrial Cyber-Physical System (ICPS) infrastructure will promote
  • next generation of intelligent and autonomous systems
  • real-time connected device monitoring and control
  • increased quality, efficient production and sustainable industrial systems.

• Faster time-to-market, more flexible collaboration and data sharing for European cyber-physical system industry

• Contribute to accelerating new growth opportunities to both communications service providers and ICPS providers

• Create intelligent, connected ICPS Ecosystems and 5G Services
Organisation Profile

- Mälardalen University (MDH)
  - One hour from Stockholm
  - 14,000 students
  - 900 employees
  - MDH has a long tradition and history of close cooperation with industry
  - Preferred research partner of ABB and Volvo

- Embedded Systems research direction
  - Largest, 6 prioritized areas
Proposal Introduction (1)

• INCYP 5G Vision
  • Provide dependable cloud-based platforms for industrial cyber-physical systems by merging 5G’s service-based architecture, private and public cloud services and sensor-based devices
  • Enable complex partner ecosystems with shared cloud, network and commercial systems
• INCYP 5G Motivation
  • Need to scale, manage, secure, analyze complex data generated by digital services and content of ICPS
  • Manage large nr. of devices that are connected and communicate with each other
  • Leverage service based architectures and dynamic network slices to meet specific application requirements for reliability, timeliness, security etc.
• INCYP 5G content

Selected use cases and requirements
5G enablers for the use cases
Solution development and validation
Dissemination and exploitation of the results

• 5 technical WPs: Use cases (WP2), Data, QoS and hazards (WP3), 5G-based Network Architecture and Platform Virtualization (WP4), Advanced 5G-enabled services (WP5), Integration, validation, demo (WP6)
• 2 organizational WPs: Project management (WP1), Dissemination & exploitation (WP7)
Proposal Introduction (2)

• Expected outcome
  • models, methods and tools that facilitate a substantial increase of dependability:
    • consistency, security and interoperability of data, operation safety, and timing predictability of using shared virtual resources
    • efficient decision-making algorithms for dynamic virtual machines placement and scheduling based on 5G network slicing
    • new 5G-enabled cloud services for ICPS
      • based on artificial intelligence/machine learning algorithms to deliver personalized services
      • create and evolve services from intelligent device data

• Impact
  • Substantial boost of dependability of cloud-based ICPS platforms based on 5G
  • Increased cross-industry collaboration and data sharing
  • Reliable, secure 5G-enabled ICPS cloud-based platforms

• Schedule
  • Start: June 2020           End: May 2013
Partners

- Sweden
  - Mälardalen University
  - ABB
  - Ericsson
  - Volvo Group Truck Operations (Volvo GTO)

- International Academic partners with expertise in
  - Real-time systems
  - Artificial intelligence/Machine learning
  - Fog/Cloud Computing, Network traffic management
  - Heterogeneous network architecture
  - Verification and Validation : Formal methods and testing

- Industrial partners – automotive, aviation, industrial automation, manufacturing etc.

www.celticnext.eu

INCYP5G, Cristina Seceleanu, Mälardalen University, cristina.seceleanu@mdh.se
For more information and for interest to participate please contact:

Cristina Seceleanu,
Mälardalen University, Sweden

E-Mail: cristina.seceleanu@mdh.se
Telephone: + 46 70 2837717
Postal Address: Högskoleplan 1, Västerås, Sweden
Web: https://www.mdh.se/ (MDH)  http://www.es.mdh.se/staff/173-Cristina_Seceleanu

Presentation available via:
www.tiny.cc/proposalidea
Join the follow-up Telco
11 Feb. 16.00 CET

Join Webex meeting
Meeting number (access code): 951 625 645
Meeting password: hZu5pmF8

Join by phone
+49-6925511-4400 Germany toll
Global call-in numbers

Can't join the meeting?

www.celticnext.eu  office@celticnext.eu