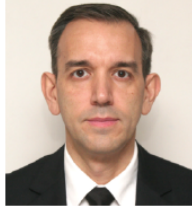


---

## Title: Artificial Intelligence Across the Communication Stack: Engineering, Human Interaction, and Governance in the 6G Era

---



**Prof. Dr. Milos Milovancevic**  
(Guest Editor)

Faculty of Mechanical Engineering,  
University of Nis A. Medvedeva 14, 18000 Niš,  
Serbia  
E-mail: milos.milovancevic@gmail.com



**Prof. Dr. Vanja Stojkovic**  
(Guest Editor)

E-mail: vanjastojkovic988@gmail.com

---

### **Proposal**

Artificial intelligence is reshaping communication at every level of the technology stack — from the physical layer of wireless signal processing to the highest layers of human social interaction and institutional governance. Yet the research literature addressing these transformations remains fragmented across disciplinary boundaries: communication engineering journals focus on spectral efficiency and network optimization, while communication and social science journals address trust, authenticity, and societal implications in largely separate conversations.

This Special Issue unites both dimensions under a single coherent thematic umbrella, bringing together original research from two complementary expert perspectives. From the engineering side, contributions address the application of advanced AI methodologies — including deep neural networks, large language models, federated learning, and generative diffusion models — to the design, operation, and security of 5G and 6G communication infrastructure. From the human-interaction and governance side, contributions address the affective, social, and institutional dimensions of AI-mediated communication, including the engineering of trust in conversational agents, the social effects of AI co-authorship in interpersonal communication, and the accountability requirements of AI deployment in public service contexts.

The convergence of these perspectives is not merely editorial — it reflects the reality that the most consequential challenges of the AI era arise precisely at the interface between the technical and the human: an LLM deployed for 6G network intent translation must also be understood in terms of operator trust and institutional accountability; a federated anomaly detection system protecting critical IIoT infrastructure must be designed with the same privacy and equity considerations that govern citizen-facing AI systems. This Special Issue creates the interdisciplinary space for that convergence.

### **SCOPE AND TOPICS OF INTEREST**

This Special Issue solicits original research articles, comprehensive reviews, and perspective papers addressing the integration of artificial intelligence across the full communication stack — from physical-layer signal engineering to human-facing interaction design and institutional governance. Topics of interest include, but are not limited to:

#### **A. AI for Communication Engineering and Network Infrastructure**

- Deep neural network architectures (CNN, LSTM, GNN, transformer, SNN) for adaptive signal processing, channel estimation, and modulation classification in 5G/6G systems
- Large language model-based cognitive agents for intent-based networking, zero-touch network management, and autonomous fault diagnosis in 6G and O-RAN architectures

- Federated deep learning for distributed model training in privacy-sensitive and critical infrastructure contexts, including IIoT anomaly detection and SCADA network security
- Generative AI and diffusion models for wireless channel synthesis, CSI data augmentation, and low-pilot MIMO channel estimation
- Edge AI deployment under hardware, latency, and energy constraints; model compression, quantization, and neuromorphic computing for ultra-low-power inference
- AI-specific security threats in communication systems: adversarial attacks, data poisoning, prompt injection, model theft, and Byzantine-robust federated aggregation

## **B. AI in Human Communication, Interaction, and Institutional Governance**

- Affective and cognitive dimensions of trust in AI-mediated communication; design frameworks for emotionally intelligent and trust-calibrated conversational agents
  - Social and linguistic effects of generative AI as mediator of interpersonal communication: authenticity, communicative labor, stylistic convergence, and relational equity
  - Conversational AI in public service delivery: accountability, citizen dignity, accessibility, equity-aware design, and governance in government and welfare AI systems
  - Ethical frameworks and regulatory compliance for AI communication systems: EU AI Act, NIS2, GDPR, and emerging standards for AI in licensed spectrum management
  - Cross-cultural variability in human-AI trust formation and implications for globally deployed conversational systems
- 
-