



SIG AI for NRENs

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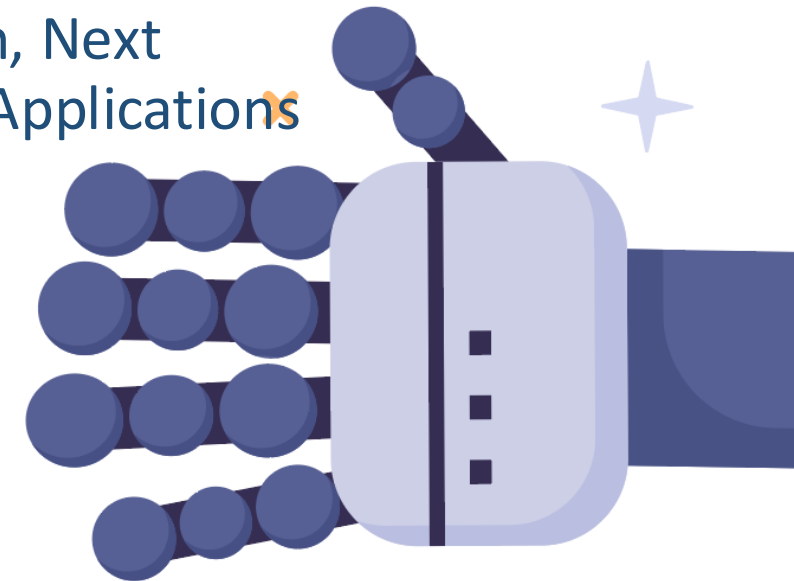
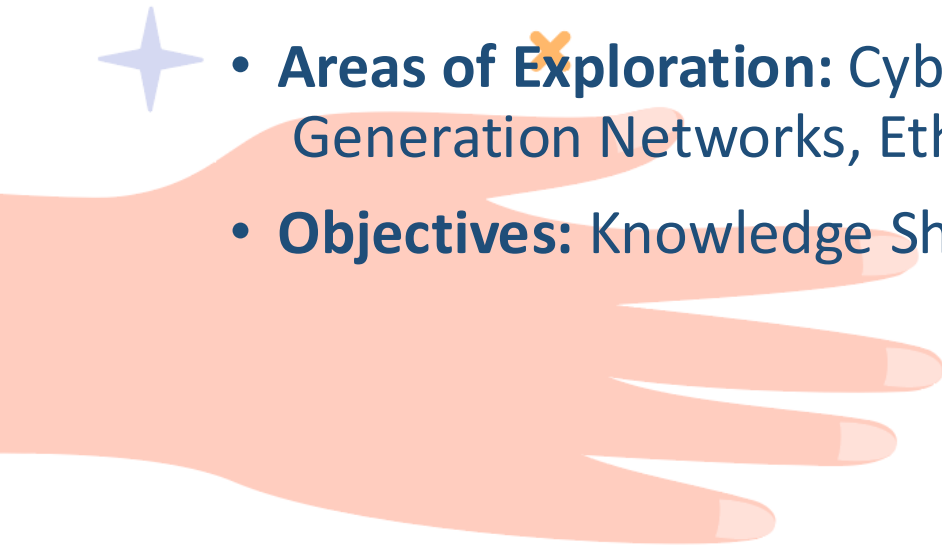
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TNC25 – SIG AI for NRENs Side-Meeting

9 June 2025

Introducing the SIG AI for NRENs: Collaborative AI Exploration

- **Newly Established SIG:** Started at TNC24 in Rennes, France
- **Focus:** Exploring the potential applications of AI within the context of NRENs
- **Cross-Cutting Approach:** Delving into various areas where AI can enhance NREN services
- **Areas of Exploration:** Cybersecurity, Network Automation, Next Generation Networks, Ethics, Policy, and Above-the-Net Applications
- **Objectives:** Knowledge Sharing, Use Case Development



AI in NRENs: Opportunities & Challenges

- Opportunities
 - Innovation Driver
 - Service Enhancement
 - Efficiency Gains
 - New possibilities (e.g. Predictive Maintenance, Dynamic Resource Allocation)
- Challenges
 - Complexity
 - Security Concerns
 - Ethical Risks
 - Skills Gap
 - Data availability
 - Data readiness for AI



SIG AI Objectives: Working Together on AI

- Knowledge Exchange
- Use Case development
- Community Hub

In the future, maybe also

- Think Tank
- Pre-Incubator
- Strategy



Who are we?

- Coordinator: Leonie Schäfer (DFN)
- Chair: Daniela Brauner (GÉANT)
- SC Members:
 - Hrachya Astsatryan (ASNET-AM)
 - Jan Kohlrausch (DFN-CERT)
 - Albert Hankel (SURF)
 - Marcin Wolski (PSNC)
 - Panos Louridas (GRNET)

Wiki

<https://wiki.geant.org/display/SIGAI/SIG-AI+Home>

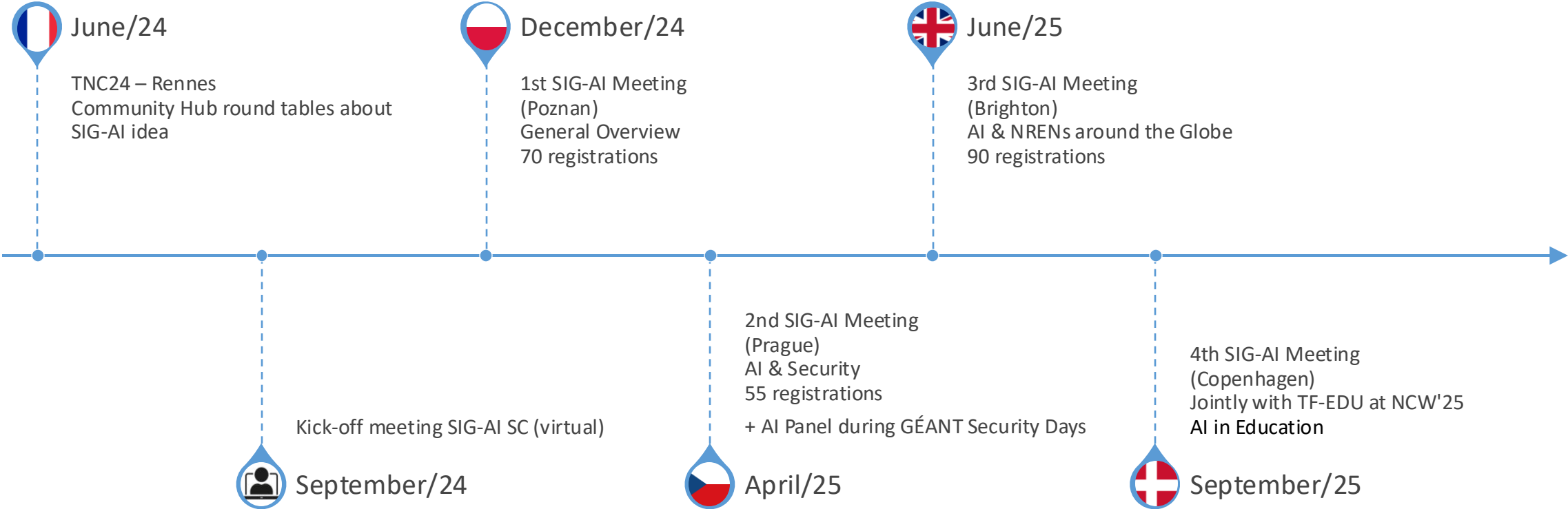


Join our mailing list:

<https://lists.geant.org/sympa/subscribe/sig-ai>



SIG-AI Roadmap



Agenda for SIG AI @ TNC25

Theme: "Advancing Research Through AI: NREN Services and International Perspectives"

Timing	Topic & Presenter
Monday 9 June	
14:00 - 14:30	Welcome & Intro - Leonie Schäfer (DFN) and Daniela Brauner (GÉANT)
14:30 - 15:30	Session I - Panel Discussion Moderator: Daniela Brauner (GÉANT) - Panellists: Iara Machado (RNP), Kennedy Aseda (KENET), Karl Newell (Internet2), Francis Lee (SingAREN, TEIN*CC) and Bartosz Belter (PSNC)
15:30 - 16:00	Coffee Break
16:00 - 16:40	Session II - Short Presentations Chair: Leonie Schäfer (DFN) Presenters: Chin Guok (ESnet), Davide Wilde (AARnet), Tanja Maier (GÉANT), Marcin Wolski (PSNC)
16:40 - 17:20	Session III - Interactive Exercise - Evaluation & Discussion Moderators: Marcin Wolski (PSNC), Hrachya Astsatryan (ASNET-AM), Albert Hankel (SURF) and Michel Gerdes (DFN-CERT)
17:20 - 17:30	Wrap-up - Daniela Brauner (GÉANT) Mentimeter & Closing - Leonie Schäfer (DFN)

Interactive Exercise



AI for NRENs - Readiness for Adoption
During the meeting you will use sticky notes to contribute your vision.



Strengths

What capabilities position us well for AI adoption/support in my country/regional/global?

What existing resources or infrastructure can support AI?

What domain advantages or partnerships do we have?

What aspects of our current operation are AI-ready?

Weaknesses

What gaps could hinder AI readiness?

What abilities are we lacking?

Where do we lack skills, systems, strategy, partnership, governance?

What challenges have already surfaced?

What limitations must we address?

Opportunities

What trends work in our favour?

How can AI elevate NREN's impact and services?

What emerging trends align with our mission?

Who could benefit most from our AI-enabled offerings?

What strategic advantages could AI unlock?

Threats

What risks could delay AI adoption?

What external factors could limit our progress?

Who or what could outpace or disrupt us?

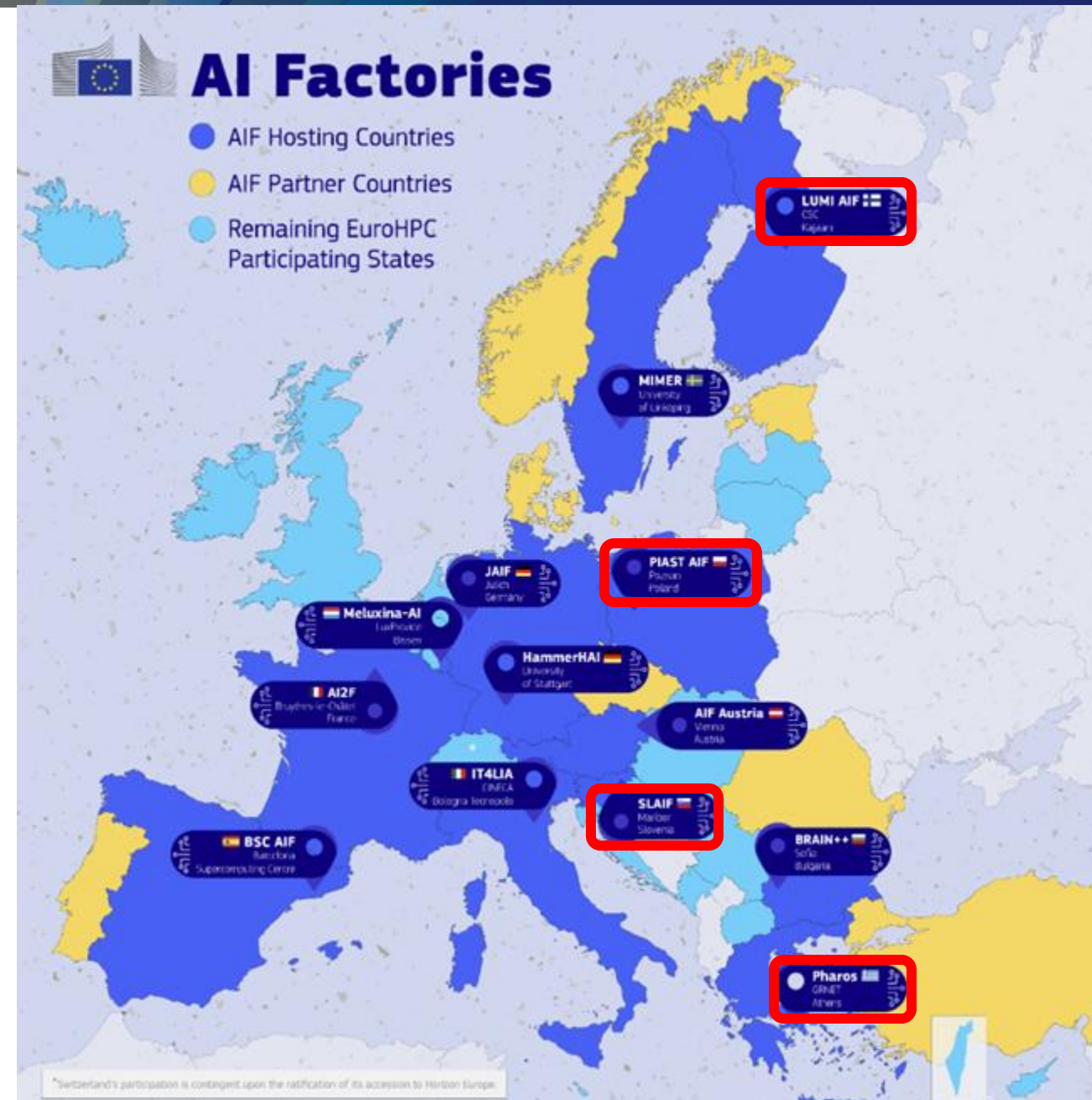
Where might AI adoption create vulnerabilities?

AI Applications in Europeans NRENs

- Unsupervised ML for PerfSONAR **data analysis** – CARNET-GÉANT
 - IP **Blacklist creation** using Neural Networks – CESNET
 - **Risk assessment** using classification models – i2Cat
 - **DDoS Mitigation** – CESNET, PSNC and RedIRIS
 - **Anomaly detection** with Machine Learning – DDoS and DNS attacks – PSNC
 - Detection of brute-force **SSH attacks** using Classification methods - CESNET
 - Retrieval-Augmented Generation agent for **Workflow Orchestration** - SURF
 - Domain classification (DGA) using Multi-Layer Perceptron (MLP) - ICCS-NTUA/GÉANT
 - Graph Neural Networks (GNNs) for Scientific **Traffic Classification** - University of Twente/GÉANT
 - LLM for **domain categorization** – CESNET
 - LogsLLM – Automated **Log Analysis** and Management based on LLMs – NTUA/GRNET/PSNC/CYNET
 - **Vulnerabilities** exploitation using a LLM judge (Giskard detectors) - PSNC
 - AI **ChatBot** – PSNC and GÉANT
 - GenAI for Network Management and Network Process Orchestration
 - ...
- AI Improvements:
- Active Learning Framework to re-train models (data drifts) - CESNET
 - Federated learning for DNS Security and AI Explainability – ICCS-NTUA/GÉANT
 - AI Security – auditing LLM, detecting malicious executable code in ML - PSNC

AI Infrastructure in European NRENs

- LISA - Secure AI Platform – LLM pre-trained models, datasets and computing services for Austrian Academic Institutions (ACOnet)
- NRENs are hosting AI Factories in PSNC(PL), GRNET(GR), CSC(FI) and ARNES (SI)





Any questions?

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