

Citizen engagement, AI-supported decision and trust for radiological impact assessment and emergency response – CITHARA: Overall concept and objectives

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CIThARA Consortium, 11 partners, 7 countries

- National Centre for Scientific Research “Demokritos”, Greece
- National Centre for Nuclear Research, Poland
- Istituto Superiore di Sanità, Italy
- Norges Miljø-og Biovitenskaplige Universitet, Norway
- Karlsruhe Institute of Technology, Germany
- Centre d’ Étude sur l’ évaluation de la protection dans le domaine nucléaire, France
- SCK-CEN, Belgium
- Bundesamt für Strahlenschutz, Germany
- Meteorologisk Institutt, Norway
- Autorité de Sureté Nucléaire et de Radioprotection, France
- École Polytechnique, France



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CIThARA overall concept

- Develop and evaluate Artificial Intelligence (AI)-based methodologies to enhance specific thematic areas related to nuclear Emergency Preparedness and Response (EPR)
- Focus on thematic areas where there is a lack of AI applications, but with potential of considerable benefits
- Special consideration of ethical and societal issues
- CIThARA was submitted and accepted for funding under the 3rd PIANOFORTE open call, Topic 3: “Use of Artificial Intelligence and Big Data techniques to improve emergency response – covering radiological impact assessments, decision support, data collection response and recovery strategies and public engagement, communication and education”
- Project duration: 36 months, 1/1/2026 – 31/12/2029



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CIThARA thematic areas

- Computational modelling systems for radionuclides atmospheric dispersion
- Countermeasure strategies in Decision Support Systems
- Integration and exploitation of citizens' radiological measurements
- Ethics and trust related to applications of AI in nuclear EPR

CIThARA 1st specific objective (SO-1)

- To develop and validate AI-driven modelling methodologies for:
- rapid forecast of radiological consequences related to atmospheric dispersion and deposition of radionuclides
 - In near ranges – complicated geometries
 - In medium and far range – spatial- and time-varying meteorological fields
 - fast localisation and quantification of unknown sources of radionuclides emissions in the medium and far ranges
 - inclusion of different types of uncertainties in the above processes

CIThARA 2nd specific objective (SO-2)

- To develop AI-based solutions to enhance and optimise countermeasure strategies in nuclear EPR under complex conditions, involving
- big data volumes
 - heterogeneous data
 - numerous influencing factors and multiple constraints
 - focusing on decision support for urban-scale nuclear emergencies

CIThARA 3rd specific objective (SO-3)

- To develop AI-based tools for citizen-generated radiological measurement datasets, to:
- enhance their quality;
 - demonstrate their added value;
 - render feasible their integration with data from official environmental monitoring networks and usage in the modelling systems developed in SO-1;
 - while ensuring privacy of citizen personal data

CIThARA 4th specific objective (SO-4)

- Addressing ethical issues and trust in relation to the usage of AI-tools in nuclear crisis management:
 - Assessment of their design, validation and implementation effects
 - Identification and conceptualization of systemic risk scenarios related to ethical dilemmas and trust issues
 - Identification of the key conditions for their safe, transparent and ethical use

CIThARA – Work packages, related SO's

- WP1 - *AI-based prediction of radiological consequences for emergency preparedness and response in the local scale*; addressing SO-1 (partly) and SO-2
- WP2 - *Citizen measurements data*; addressing SO-3
- WP3 - *AI-based long-range surrogate atmospheric dispersion modelling and advanced inverse modelling*; addressing SO-1 (partly)
- WP4 - *Mastering Trust in Application of AI in Crisis Situations*; addressing SO-4
- WP5 - *Project Management, Data Management, Dissemination, Impact Creation*

CIThARA overall concept and objectives

Presentations follow corresponding to the project scientific / technical WPs

Thank you for your attention!



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