**1. Bibliographic data**

**Title:** Requirement Engineering Challenges for AI-intense Systems Development

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**2. Theme of the paper**

**Scientific area:** RE and AI

**Specific topics:**

* challenges in requirements engineering for the more AI intense systems
* contextual definition and specification of requirements
* data quality and data management in AI systems
* performance definition, monitoring and quality assurance in AI applications
* impact of human factors in AI intensive systems

**3. Synthesis of the paper**

**Motivation and importance of the research**

The availability of advanced computational resources and AI capabilities allows increasingly complex AI intense systems, promising societal benefits but presenting significant engineering challenges. Ensuring behavior, quality attributes and managing uncertainty in these systems pose new issues for RE

**Main points of the background information and state-of-the-art**

* the traditional system engineering methodologies are not able to deal with AI intensive systems due to the complexity, volume of data processing and dynamic environments where these are operating
* today's practices are unable to address requirements specification, especially that of quality attributes and behavioral assurances for AI components, which are quite different from those of conventional software components

**Main findings and results and their novelty**

It specifies four areas of RE challenges for AI intensive systems:

* The precise definition of context (for instance, Operational Design Domain - ODD for autonomous driving) is key to ensuring the desired AI model behavior
* Management of data quality attribute (accuracy, relevance, distribution) is critical because data quality has an impact on AI performance
* Performance tracking and measuring: there must be the existence of credible performance metrics and real time monitoring tools to assure the quality and conduct of AI systems
* Human factors: human interaction needs to be integrated into AI system design in order to promote acceptance and appropriate use

Novelty is the explicit association of these problems to industrial, automotive and residential intelligent environment application areas and examples include but are not restricted to ADAS and intelligent mirrors in the home.

**Main conclusions and/or discussion points**

* the system requires new RE approaches that include context, data management, monitoring of performance and human factors
* classic RE techniques and validation procedures are no longer enough for AI models due to dynamic contexts and unpredictable machine learning model conduct
* the paper calls for the establishment of systematic ways to characterize and report contexts and data quality and improved techniques for monitoring and checking on an ongoing basis
* designing user experience is an essential aspect of human factors within AI intensive systems and demands greater integration of user experience design into the RE procedures

**4. Questions and reflection**

**Questions raised by the reading of the paper**

* standardization activities such as the establishment of an operational design domain can become universally accepted across various industries?
* what are the precise methodological adjustments to be made within prevailing RE practices to include data quality and the contextual dynamics of AI systems comprehensively?
* How do you reconcile fast and agile deployment modes with thorough integration of human factors in very dynamic AI driven environments in practice?

**My opinion about the paper**

The article is an informed and timely overview of the key RE issues in AI intensive systems. It is well structured and separated into problem domains and actual industry related illustrations. The article may, however, have explored implementation techniques at the level of real world practices or instances of good adoptions in enterprises

**What to retain for my future research/professional practice**

* the need to establish context and data attributes at the initial stages of the RE phase to deal with AI related uncertainty
* the necessity for the integration of strong performance metrics and online monitoring within ongoing improvement procedures for AI intensive applications
* identification of the critical role of human factors in facilitating user trust, acceptance and overall success of AI intensive systems, which requires special attention during the requirements engineering phase