Workshop: Techno-ethics Perspective for UAV-assisted Data Collection

ABSTRACT

Climate change intensifies extreme weather events, increasing landslide risks and disrupting communication networks crucial for emergency response. UAVs (unmanned aerial vehicle), with their flexibility and 3D maneuverability, offer a solution by restoring connectivity and gathering critical safety data.

Key challenges in UAV deployment include optimal placement as base stations and designing flight paths for efficient data collection. A promising approach involves estimating a propagation channel map, which models signal behavior in the environment to ensure effective UAV-user connectivity.

To generate these maps, we use a simulation-based method that controls and varies key parameters, producing large-scale measurement data. An AI model then leverages this dataset to predict radio propagation in unseen environments, enhancing UAV-assisted emergency response strategies.

However, gathering information from the environment using UAVs triggers serious ethical concerns for example safety issues, ethics and morals, privacy, etc.

With the intent of addressing ethical concerns as well as technological developments, a techno-ethics approach would be helpful to assess ethical use of UAVs in such critical conditions. We will conduct a dialogue on the principle of beneficence, non-maleficence, autonomy, justice, and explicability to ensure that the deployment of UAVs in emergency conditions align with the ethical values and respect human dignity at three key stages of UAV deployment: preparedness, response, and recovery. The beneficence principle emphasizes the well-being of others and taking actions that benefit them. The principle of non-maleficence means “do no harm”. The autonomy principle refers to respecting the free choice and self-determination of individuals and groups. The principle of justice involves ensuring fair and equal distribution of benefits. The explicability principle refers to the need for transparency and understandability of the technology.

To elicit the ethical concerns associated with UAV-deployment, we will conduct a mini workshop, conducting dialogue with emergency management practitioners on how the interplay between techno-ethics and the deployment of emerging technologies like UAVs provides a framework for assessing their implications from the perspectives of academia and practitioners.

The purpose of the workshop is to explore the techno-ethics approach concerning the use of UAV. Additionally, to discuss, how the ISCRAM community should approach these issues and to understand the public or citizen concerns concerning the use of UAV in emergency management, especially based on the topic proposed in this workshop (Radio map usage in Landslide Area).

We use an interactive dialogue method where groups are given a specific situation description, and they are asked during the workshop how they think they will search for more information and self-assess how they would behave in this situation.

The expected outcome of the workshop is that we can accumulate the knowledge from different ISCRAM member participants who have different background to understand better the techno-ethics dimension of UAV in the crisis management.

Participants of workshop should bring their own device that has internet connection, ability to use Mentimeter and Miro – two supporting tools we will used in the workshop -- either from a laptop or from a mobile phone to explore the topics. There is a possibility we will combines sticky notes and the use of Strategy finders tool for preferencing and collecting ideas.

PRESENTER/DEMONSTRATOR

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Prasenjit is a PhD student at the Department of Information and Communication Technology, University of Agder, Norway. His research interests are on UAV-assisted wireless communication, radio propagation maps, signal processing, machine learning. In this context, Prasenjit explores usage of UAVs in emergency condition and associated ethical concerns.

I do not have prior experience of presenting at ISCRAM.

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Jaziar a full professor in the Department of Information Systems at the University of Agder, focuses on Crisis Management. Her research interests are situational awareness, technology supported emergency management, modelling and simulation, disaster resilience, digital resilience, and information security management and privacy. In this context, Jaziar is interested in contextualizing the techno-ethics perspective in the usage of drone for crisis management.

Jaziar has frequently attended ISCRAM Conference sin 2014. Jaziar will support Prasenjit to address the topic.

**Corresponding presenter*