The document presents a study on leveraging semi-supervised learning for classifying multimodal disaster-related tweets, which can aid relief authorities in real-time situational awareness during natural disasters. The authors, Iustin Sirbu, Tiberiu Sosea, Cornelia Caragea, Doina Caragea, and Traian Rebedea, propose an extension of the FixMatch algorithm to a multimodal setting, using soft pseudo-labels to address subjective annotations and potentially overlapping labels. They apply their approach to the CrisisMMD dataset, which includes tweets with text and images from various disasters in 2017.

The study demonstrates significant improvements in F1 scores across three classification tasks—informativeness, humanitarian, and damage assessment—particularly in low-data scenarios. The authors attribute these improvements to the use of a large unlabeled dataset collected using text queries and basic preprocessing. They also provide an extensive error analysis and discuss the generalizability of their method beyond disaster tweet classification.

The paper contributes to the field by extending the FixMatch algorithm to multimodal data, showing the effectiveness of leveraging unlabeled data for improving classification tasks, and offering a detailed analysis of the semi-supervised approach's predictions compared to supervised models. The authors make their code and data publicly available, and their experiments indicate that their method outperforms existing approaches, especially in low-resource settings.

The document also includes a section on related work, discussing various semi-supervised learning methods and their applications to text and image classification. It details the methodology, including baseline modeling, semi-supervised learning adaptations, and data augmentation techniques. The paper concludes with a discussion of the limitations of the proposed method, such as increased training time and potential challenges in collecting relevant unlabeled data for other datasets.

Overall, the study provides a comprehensive analysis of a semi-supervised approach to multimodal disaster tweet classification, highlighting its potential to enhance disaster response efforts by efficiently utilizing both labeled and unlabeled social media data.