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ENGAGING THE GENERAL PUBLIC IN SPACE ACTIVITIES WITH MATH-POWERED POETRY ANALYSIS

Abstract

In May 2013, with a contest dedicated to MAVEN (Mars Atmosphere and Volatile EvolutioN missile), NASA invited its public to compose poems devoted to the mission, submitting them to public voting on an ad-hoc website. Each poem had to follow the three-line structure with 5-7-5 syllables of Japanese haiku poems. Given the overwhelming success of the campaign – more than 12,530 poems received from around the world in two months - the poems voted 2+ (i.e. over 1,100 haiku) were embarked on MAVEN. As reported at the time: "The contest resonated with people in ways that I never imagined... Both new and accomplished poets wrote poetry to reflect their views of Earth and Mars, to share their feelings about space exploration, ...". Similarly, in July 2021 the Haiku Foundation - a nonprofit organization created to preserve the accomplishments of modern haiku poets – started offering a weekly prompt for practicing haiku: for 9 weeks posts appeared each Wednesday with a new space-related theme, along with about 60 poems from the previous week selected from the hundreds received, demonstrating the impact that outer-space has on people's imagination, even when it is to be expressed in a few syllables. This paper aims at analyzing the haiku selected and published by The Haiku Foundation, in order to identify not only the most recurring words but also associated semantic fields, which can then be used for the adaptation of texts aimed at engaging the general public in space activities, outside the formal education system. After a short introduction to haiku poetry, the Haiku Foundation series of haiku will be subjected to automatic text analysis techniques, in particular topic modeling, an unsupervised machine learning technique capable of scanning a set of documents, detecting words and patterns within them, and automatically clustering word groups and similar expressions that best characterize the set of documents. In order to extract as much information as possible, word embedding techniques will also be used in order to clarify the relationships between the terms used, complete the analysis and facilitate the synthesis and interpretation of the information obtained. Comments on a few haiku containing the most utilised words per space domain will be provided, too, with a few examples of how past space science, exploration and/or application outreach texts could have been more effectively written by applying the results of the above text analysis, highlighting the main resulting recommendations.