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This paper investigates a novel approach for attitude control of 2 satellites acting as a virtual telescope. The Virtual Telescope for X-ray Observations (VTXO) is a mission exploiting 2 6U-CubeSats operating in a precision formation. The goal of the VTXO project is to develop a space-based, X-ray imaging telescope with high angular resolution precision. In this scheme, one CubeSat carries a diffractive lens and the other one carries an imaging device to support a focal length of 100 m. In this mission, the attitude control algorithms are required to keep the two spacecraft in alignment with the Crab Nebula observations. To meet this goal, the attitude measurements from the gyros and the star trackers are used in an extended Kalman filter, for a robust hybrid controller, and the energy and accuracy of attitude control is optimized for this mission using neural networks and multi objective genetic algorithm.

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