

基于星座聚类的星敏感器导航星优选算法研究

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摘要: 讨论恒星星座特征, 分析 Mean Shift 算法原理, 提出根据恒星的惯性坐标系位置, 以星对角间距为特征, 通过迭代将当前视场内恒星划分星座的思想, 设计基于星座聚类优选导航星的算法, 详细说明具体的实施步骤. 以 SAO 星表为原始星数据, 开展了可见光波段导航星优选实验. 实验表明, 提出的导航星优选算法, 计算简单, 易于实现, 所得导航星分布均匀性优于 MIPS、正交网格等算法.

关键词: 星敏感器; 导航星; 星座聚类; Mean Shift; 玻尔兹曼熵

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Study on Optimal Selection Algorithm of Guide Stars

Based on Star Clustering for Star Sensors

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Abstract: Star cluster features are discussed. The algorithm of Mean Shift is analyzed. The idea that distributes stars in the location field of view to clusters is proposed by iterative operation using the characteristic of star pair angular separations according to the star positions in the inertial coordinate system. The optimal selection algorithm of guide stars based on star clustering is designed. Its detailed implement procedures are introduced completely. The guide star optimal selection experiment in visible band by using SAO star catalog as the original star data is fulfilled. It proves that the proposed algorithm has the virtue of simple calculation and easy realization. The obtained guide star distribution is more uniform than the MIPS algorithm and the grid algorithm.

Key words: star sensor; guide star; star clustering; Mean Shift; Boltzmann entropy

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