Evaluation Of User-Friendliness Of Several Uass In Bridge Inspection

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Although the application of Unmanned Aerial System (UAS) in modern bridge inspection as a supplementary approach, has been gaining more and more attention due to numerous potential advantages such as safety, accessibility, consistency, improved deliverables, and streamlining capability, it still faces certain challenges when implemented in practice from the perspective of user-friendliness/user experience. This paper firstly selected three promising UASs including Phantom4, Skydio2, and Elios2 based on several critical factors including flight time and range, camera/video versatility and resolution, collision tolerance, illumination capability, and GPS reliability. Then the three UASs were quantitatively evaluated on their maneuverability and robustness based on their expected and actual fly route under different flying conditions including wind intensity, temperature, and humidity. The real time location of the UASs is monitored by the Vicon system while the flying condition is monitored by AcuRite wireless weather station during the test. Based on the test results, this paper then further discussed several recommendations of the UAS application in bridge inspection, to promote its adoption by more states of Department of Transportation (DOT) to help alleviate the ever-growing bridge maintenance cost and improve the quality of bridge inspections.