Anti-Sway Control System Improves Crane Safety, Saves Time

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Industrial crane operators typically manipulate the independent motions of trolley, hoisting and traverse when they are moving payloads. This, however, can result in an uncontrolled swaying motion, which slows down the construction process because extra time is required to let the swaying motion come to a stop. Uncontrolled swaying is also a safety issue that can result in serious injury.

Led by associate professor Ong Chong Jin, researchers at the National University of Singapore's Mechanical Engineering Department have developed a highly effective solution to the control of payload sway in industrial crane and crane-like structures. The "Anti-Sway Control of a Crane Under Operator's Command" technology was developed in 2000.

> *The use of this technology on construction sites improves safety; labor costs are also reduced because operators spend less time waiting for swaying motions to cease.*

In response to the operator's command for trolley, hoist and traverse motions, this software program utilizes a family of differential equations to calculate the precise counter-adjustments necessary for canceling out sway. The differential equations are solved in real time, using sensory measurement of the cable length and its time derivative.

The program also responds immediately to the operator's commands under simultaneous trolley/hoisting and traverse/hoisting motions. The software takes into account the acceleration, velocity, and span limits of the drive system of the crane to ensure the anti-sway control is not compromised when these limits are reached.

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