

## Unifying Approach to Observer-Filter Design

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*Abstract:* The paper examines similarities between observer design as introduced in Automatic Control Theory and filter design as established in Signal Processing. It is shown in the paper that there are obvious connections between them in spite of different aims for their design. Therefore, it is prospective to make them be compatible from the structural point of view. Introduced error invariance and error convergence properties of both of them are unifying tools for their design. Lyapunov's stability theory, signal power, system energy and a power balance relation are other basic terms used in the paper.

*Keywords:* observer; invariance; convergence; filter; signal power; system energy;

*AMS Subject Classification:* 93C10; 93C05;

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