General entropy-based framework for a robust and fail-safe multi-sensor data fusion

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Key Performance Indicators

General Overview

Challenges

Objectives

Localization

• Robust
• Fail-Safe
• Accurate
• Continuous
• Precise
• Available

Proposed Approach

Autonomous Driving Vehicle

Used sensors

Tools and solutions

Adaptive Diagnosis Based on Parametric Residual

\[ RD_\alpha(q(k−1)|q(k/k)) = \frac{1}{2}\alpha \sum_{i=1}^{2} \left( \frac{Y_{i,k} - Y_{i,k-1}}{\alpha Y_{i,k} + (1-\alpha)Y_{i,k-1}} \right)^2 \] 

\[ + \frac{1}{2(\alpha-1)} \sum_{i=1}^{2} \left( \frac{X_{i,k-1} - X_{i,k}}{\alpha X_{i,k} + (1-\alpha)X_{i,k-1}} \right)^2 \]

\[ \alpha-\text{Rényi criterion for decision making} \]

\[ R_{\alpha} = \frac{1}{1-\alpha} \sum_{i=1}^{2} \log \left( \frac{p(u_i|H_i)}{p(u_i)} \right) p(H_i) \]

Results and Conclusions

Partials Rényi observation for identification