0173 SPARKLE - AI for Image Identification

Automated identification of hidden, counterfeit and anomalous components in complex electronic assemblies

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THE OPPORTUNITY

Global electronics supply chains face counterfeit components, malicious hardware modifications and hidden elements. Existing optical or basic X-ray inspection can lack the intelligence to detect sophisticated anomalies automatically.

1 TECHNOLOGY

SPARKLE combines X-ray and optical inspection with AI-based data fusion. Its patented method thresholds and segments images, builds per-object greyscale references and identifies objects using correlation-based matching.

2 APPLICATIONS

- Electronics manufacturing and quality assurance
- Supply-chain provenance and counterfeit detection
- Security screening and defence hardware verification

3 KEY BENEFITS

- Recognises internal components from penetrating images
- Supports normal-versus-abnormal device comparison
- Reported 3-second analysis versus 120 seconds for HOG+SVM

EVIDENCE & DEVELOPMENT STATUS

- Stage: patented technology with an integrated inspection concept; a functional multi-modal prototype is the stated next output.
- Patent reports use in real operational environments and 40× faster analysis than HOG+SVM in the stated example.
- Experiments on 48 laptop images reported 95% sensitivity and 96% specificity; material-similarity analysis produced 100% specificity.
- Next milestone: validate automated anomaly and concealed-object detection using X-ray and optical data in industrial scenarios.

IP & OWNERSHIP

- Patents: granted in US, EU, UK

PARTNERSHIP SOUGHT

- Licensing or technology integration
- Collaborative prototype development
- Industrial pilot and validation partner

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