Literature Survey

Review of Existing Systems:

Sr. No.	System/ Paper	Authors/ Source	KeyFeatures	Limitations
1	Automating the Detection of Oil Spills from Sentinel-1 SAR Imagery Using Deep Learning [Thesis].	Al Hashmi, M. (2023)	Uses **deep learning** techniques for automating oil spill detection.	Being a thesis, might have limited peer review compared to journal articles.
2	Fast detection of oil spills and ships using SAR images	Lupidi et al. (2017)	Uses **SAR images** which are suitable in cloudy or night-time conditions.	Limited exploration of **deep learning** or AI methods.
3	Oil spill detection from Synthetic Aperture Radar Earth observations: a meta-analysis and comprehensive review	Jafarzadeh et al. (2021)	Provides a **comprehensive review** of SAR-based oil spill detection.	Does not propose a new method—purely a review.
4	Furuno's Operator Manual for U-AIS Transponder	https://www.furuno.com/en/support/manuals/	Provides **technical specifications** and operational guidelines for AIS devices.	Not academic or analytical—more of a **technical manual**.
5	A new ship tracing technology from oil spills based on multi-source data	D. Luo et al.	Suggests use of **multi-source data fusion** for tracing ships responsible for spills.	Unclear if peer-reviewed or published.

Limitations of Existing Systems :

- **High False Positives & Limited Accuracy**

  Traditional SAR-based methods often misidentify natural look-alikes (e.g., low wind areas) as oil spills, leading to unreliable results (Lupidi et al., 2017; Jafarzadeh et al., 2021).

- **Lack of Automation & Data Integration**

  Many systems do not fully utilize deep learning or multi-source data (e.g., AIS), resulting in poor scalability and limited ability to trace spill sources (Al Hashmi, 2023; Furuno Manual).

- **Poor Generalization & Standardization**

  Models often fail to perform consistently across different regions due to environmental variability and lack standardized datasets for evaluation (Jafarzadeh et al., 2021).