

Project Proposal: ReConPatch

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I. ABSTRACT

In this project, our primary objective is to explore and implement advanced computer vision techniques for **anomaly detection** within the context of industrial manufacturing.

We seek to unlock its full potential in augmenting the efficiency and precision of anomaly detection tasks by also boosting its accuracy and reliability. We are willing to demonstrate, with our own implementation, the effectiveness of CV based methods and their potential to be applied in real-world scenarios.

II. OBJECTIVE

We aim to reimplement and potentially advance the ReConPatch method proposed in the paper titled **”ReConPatch: Anomaly Detection by Linear Modulation of Pretrained Features.”** [1] This method addresses the challenge of anomaly detection by constructing discriminative features through a linear modulation of patch features extracted from pre-trained models and employs contrastive representation learning to collect and distribute features in a way that produces a target-oriented and easily separable representation of the data.

III. RESOURCES

We plan to compare our implementation with the original ReConPatch method to evaluate its performance and identify potential areas for improvement. We will use the data from **MVTec AD**[2] and **BTAD**[3] dataset that have been used in the original paper.

Additionally, all the code and data will be stored in a GitHub repository for version control and collaboration, at the following link: <https://github.com/dario-loi/ReConPatch-torch>

REFERENCES

- [1] Hyun, Jeeho & Kim, Sangyun & Jeon, Giyoung & Kim, Seung & Bae, Kyunghoon & Kang, Byung. (2023). ReConPatch : Contrastive Patch Representation Learning for Industrial Anomaly Detection.
- [2] Paul Bergmann, Michael Fauser, David Sattlegger, and Carsten Steger. Mvtec ad—a comprehensive real-world dataset for unsupervised anomaly detection. In Proceedings of the IEEE/CVF conference on computer vision and pattern recognition, pages 9592–9600, 2019
- [3] Pankaj Mishra, Riccardo Verk, Daniele Fornasier, Claudio Piciarelli, and Gian Luca Foresti. Vt-adl: A vision transformer network for image anomaly detection and localization. In 2021 IEEE 30th International Symposium on Industrial Electronics (ISIE), pages 01–06. IEEE, 2021.