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## PURPOSE

This study investigates leveraging AI for predicting inconclusive and repeat radiographic imaging in radiology. The primary objective is addressing challenges from poor visualization and repeat imaging, leading to delays in patient diagnosis and treatment planning. The study explores how AI, with deep learning advancements, can monitor suboptimal exams radiologically and from a workflow perspective, preventing setbacks by offering immediate feedback.

## METHODS

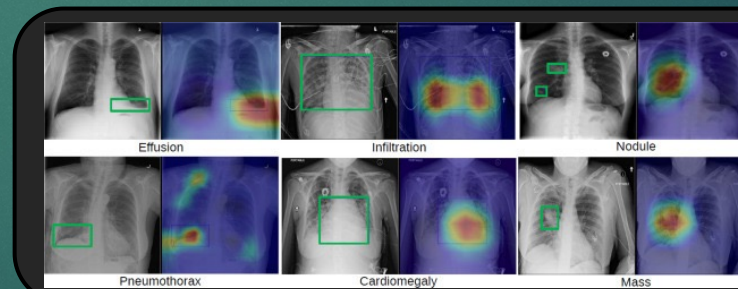
The research explores recent applications of AI in radiology and other fields to showcase their success in algorithmic function and pattern recognition. By examining cases in which AI has been used and proven effective, we can propose utilization of AI for preventative quality control of radiographs and fulfillment of imaging orders that may be inefficient. Two fields in which AI use is explored include pattern recognition and demarcation of anatomical landmarks in radiographs, as well as algorithmic prioritization of parameters and how it can be translated in radiology departments to prevent repeat imaging when a more conclusive exam is already present.

## RESULTS

Machine learning and deep learning have been tested by physicians and proved successful in recognizing anatomical structures, outlining tumors, and even diagnosing uncomplicated pathologies in various modes of radiology. Basic algorithms of AI can be programmed to evaluate different parameters, the simplest model of which can order items by importance in the same way that physicians have differential preferences for diagnostic tools with different cases.

## CONCLUSION

The tools provided by AI and machine learning can be efficiently and dependably integrated into radiology departments to predict and prevent inconclusive imaging by first examining radiographs using their own pattern recognition algorithms to give instant feedback to technicians. Additionally, AI algorithms can eliminate repeat exams when they are not needed, such as cases where an Xray is being taken *after* a gold standard tool such as a computed tomography (CT) scan has already been utilized. This can reduce common sources of delays and repeat visits for patients as well as streamline care and plan of treatment.



AI localization of abnormalities of where AI generated diagnosis was based on

Jin D, Harrison AP, Zhang L, Yan K, Wang Y, Cai J, Miao S, Lu L. Artificial intelligence in radiology. *Artificial Intelligence in Medicine*. 2021:265–89

## SOURCES

Examples of recent applications of AI as they pertain to the objectives of this abstract:

Blezek, D.J., Olson-Williams, L., Missert, A. *et al.* AI Integration in the Clinical Workflow. *J Digit Imaging* **34**, 1435–1446 (2021). <https://doi.org/10.1007/s10278-021-00525-3>

Chao Jin, Jayaram K, Udupa, Liming Zhao, Yubing Tong, Dewey Odhner, Gargi Pednekar, Sanghita Nag, Sharon Lewis, Nicholas Poole, Sutirth Mannikeri, Sudarshana Govindasamy, Aarushi Singh, Joe Camaratta, Steve Owens, Drew A. Torigian, Object recognition in medical images via anatomy-guided deep learning, *Medical Image Analysis*, Volume 81, 2022, 102527, ISSN 1361-8415, <https://doi.org/10.1016/j.media.2022.102527>.

Erickson, B.J., Langer, S.G., Blezek, D.J. *et al.* DEWEY: The DICOM-Enabled Workflow Engine System. *J Digit Imaging* **27**, 309–313 (2014). <https://doi.org/10.1007/s10278-013-9661-0>

Jin D, Harrison AP, Zhang L, Yan K, Wang Y, Cai J, Miao S, Lu L. Artificial intelligence in radiology. *Artificial Intelligence in Medicine*. 2021:265–89. doi: 10.1016/B978-0-12-821259-2.00014-4. Epub 2020 Sep 11. PMID: PMC7484814.