

Using AI to streamline precision oncology: Northeastern collaborates with JAX's Maine Cancer Genomics Initiative

The Problem

- ▶ **Growing complexity in cancer care:** Oncologists face challenges keeping up with rapidly advancing precision oncology, including detailed biomarker testing and new immunotherapies, particularly in rural areas with limited specialist coverage.
- ▶ **Rural healthcare disparities:** Many oncologists in rural regions are generalists who must treat multiple cancer types without specialized support, making it difficult to stay current with treatment advances.
- ▶ **Extensive documentation burden:** Experts must review complex, unstructured documents (test results, handwritten notes, medical record fragments) before meetings and create detailed meeting minutes for treating oncologists.
- ▶ **Time allocation challenge:** More than 50% of experts' time is consumed by case preparation and summarization tasks, significantly limiting the number of patients who can benefit from their expertise.

About MCGI:

The Maine Cancer Genomics Initiative (MCGI) is a collaboration between Maine's oncology providers and The Jackson Laboratory. MCGI's goal is to improve access to advanced cancer care and precision medicine for Maine and New England. **The work has proven particularly impactful in low-resource, rural areas. MCGI has impacted more than 3,500 patients since its founding in 2016** - providing access to advanced genomic testing technologies, precision medicine interpretation support or local clinical trial availability.

“Working with Northeastern's Institute for Experiential AI and the Roux Institute to automate the time-consuming process of cleaning up data for the treating oncologist and our team of experts ultimately will give our GTB team more time for the crucial work of identifying treatment options for patients.”

– Leah Graham, Ph.D., Program Director, MCGI

“The team at EAI and the Roux Institute go beyond the standard project management methodologies one might expect from a typical development partner. Their expertise and collegiality make this project a true collaborative effort.”

– Jennifer Bourne, M.S., Operations Manager, MCGI.

Northeastern delivered a system designed to swiftly parse and summarize vital information could help MCGI's Genomic Tumor Board experts dedicate their full attention to their expertise in genomics and cancer care.

The Solution

In an effort to streamline meeting preparation and summaries, Northeastern's team of experts from the Institute for Experiential AI (EAI) and the Roux Institute are collaborating with MCGI and leveraging **AI tools to summarize and extract key information from patient health records**. The processes perform optical character recognition to read handwritten notes and other hard-to-discern records **using specialized prompt algorithms for large language models (LLMs) and neural networks**. The systems aim to perform two primary functions:

- ▶ **Automate document processing** to reduce manual entry
- ▶ **Automatically structure meeting transcripts** into queryable summaries, making it easier for experts to retrieve insights and streamlining decision-making



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Results:

These solutions could bring substantial efficiency improvements to the GTB workflow, saving time for genetic experts and physicians so that they are free to focus on what they do best – helping patients.

MCGI compared the AI outputs with work from MCGI's human experts across more than 3,000 pages of unstructured intake documents for 148 patients. **In this run, they determined the LLM tools successfully extracted complicated genomic testing data and processed clinical intake documents, and that the neural networks were 90% accurate in reproducing materials from intake documents.**



“Cancer remains the second leading cause of death in the US, and precision oncology has the potential to change that. By using AI to simplify complex processes, we're helping clinicians across the country access the insights they need to provide more personalized, effective treatments – and ultimately, better care for more patients.”

– Maria Giovanna Trovato, Global Strategy & Business Development in Healthcare and Life Science, The Institute for Experiential AI