



COLLEGE of AMERICAN
PATHOLOGISTS

Generative AI

Use in Non-Billing Purposes

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September 23, 2025

Eyas Hattab, MD, MBA, FCAP

- Member, Practice Management Committee, House of Delegates
- Professor and Chair of Pathology and Laboratory Medicine at University of Louisville
- AP/CP trained with subspecialty fellowships in neuropathology and oncological surgical pathology
- President Elect, Association for Academic Pathology (AAPath)



Disclaimer

The information presented today represents the opinions of the panelists and does not represent the opinion or position of the CAP.

This should not be used as a substitute for professional assistance.

The information in this presentation is provided for educational purposes only and is not legal advice.

Disclosure

Dibson Dibe Gondim Patent Application

El-Baz, A., **Gondim, D. D.**, Shalaby, A., Abo El-Ghar, M., Soliman, A., & Abou El-Ghar, M. (2022). *Systems and methods for digital transformation of medical images and fibrosis detection* (U.S. Patent Application No. US20220406049A1). University of Louisville Research Foundation, Inc. <https://patents.google.com/patent/US20220406049A1>

Introduction



WILL AI REPLACE PATHOLOGISTS? THE TRUTH FROM LEADING HEMATOLOGY LABS IN 2025

by [Similoluwa Oluwalana](#) - August 20, 2025



Pathologists face uncertain future in AI era:
Will they lead or be left behind?

Pathology has been revolved around the microscope, but the transition to digital platform has created a new era of integration. High-resolution whole-slide imaging now allows for remote unimagined analysis and computational analysis at scales previously impossible. These technologies are opening the door for automation.

ARTIFICIAL INTELLIGENCE VS. HUMAN EXPERTISE IN PATHOLOGY

Artificial intelligence, AI, has been one of the most talked-about topics in pathology for years. AI stands on the shoulders of digital pathology, which can already feel threatening to the expert who has maybe spent decades looking at specimens in a microscope. Will all this rapidly developing technology make the expert obsolete?



the Pathologist Pathologists Versus AI

When it comes to new technology, shouldn't we be thinking in terms of collaboration rather than competition?

Introduction



The
Harvard
Gazette

Findings | Campus & Community | Health | Science & Tech | Menu | 

HEALTH

New AI tool can diagnose cancer, guide treatment, predict patient survival

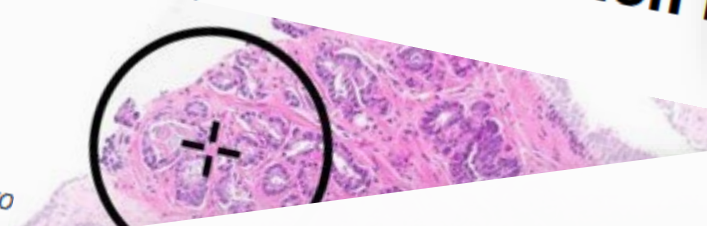
News | Articles | April 7, 2025


Paige PanCancer Detect Earns FDA Designation for Multi-Tissue Cancer Detection

Author(s) Jordyn Sava

Fact checked by: Jason M. Broderick

Paige PanCancer Detect has gained FDA breakthrough device designation for use across tissues.





Memorial Sloan Kettering
Cancer Center

Introducing DeepHeme, A New AI Tool To Improve Blood Cancer Diagnosis

By Julie Grisham, Wednesday, June 11, 2025

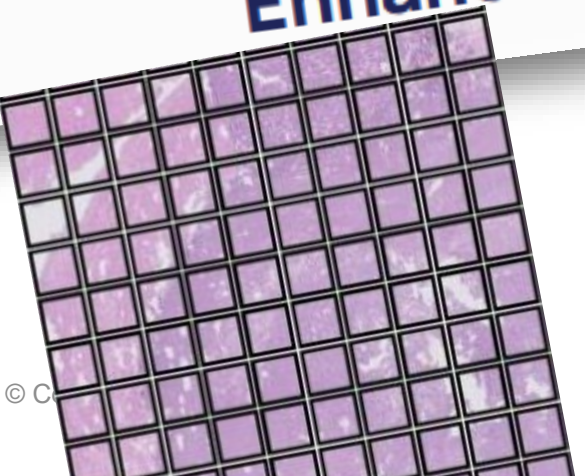
Dec 15, 2021 10:05 AM Eastern Standard Time

University of Louisville Health Adopts Paige AI-enabled Cancer Detection Software for Enhanced Cancer Detection

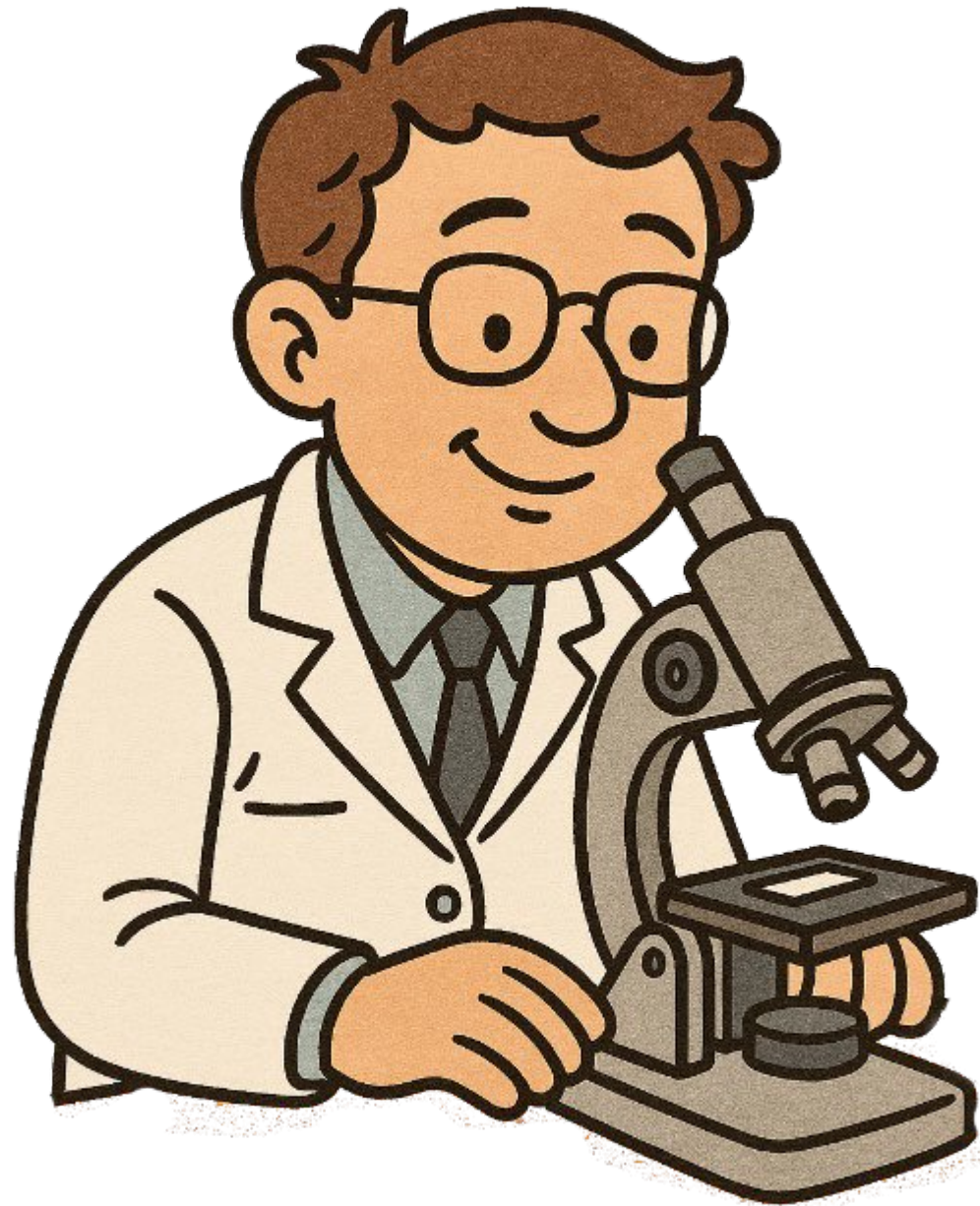
REVIEW

Unveiling the future: the impact of artificial intelligence in diagnostic pathology

Kartavya Kumar Verma^{1*}, Ruchira Palmal² and Priyanka Yadav³



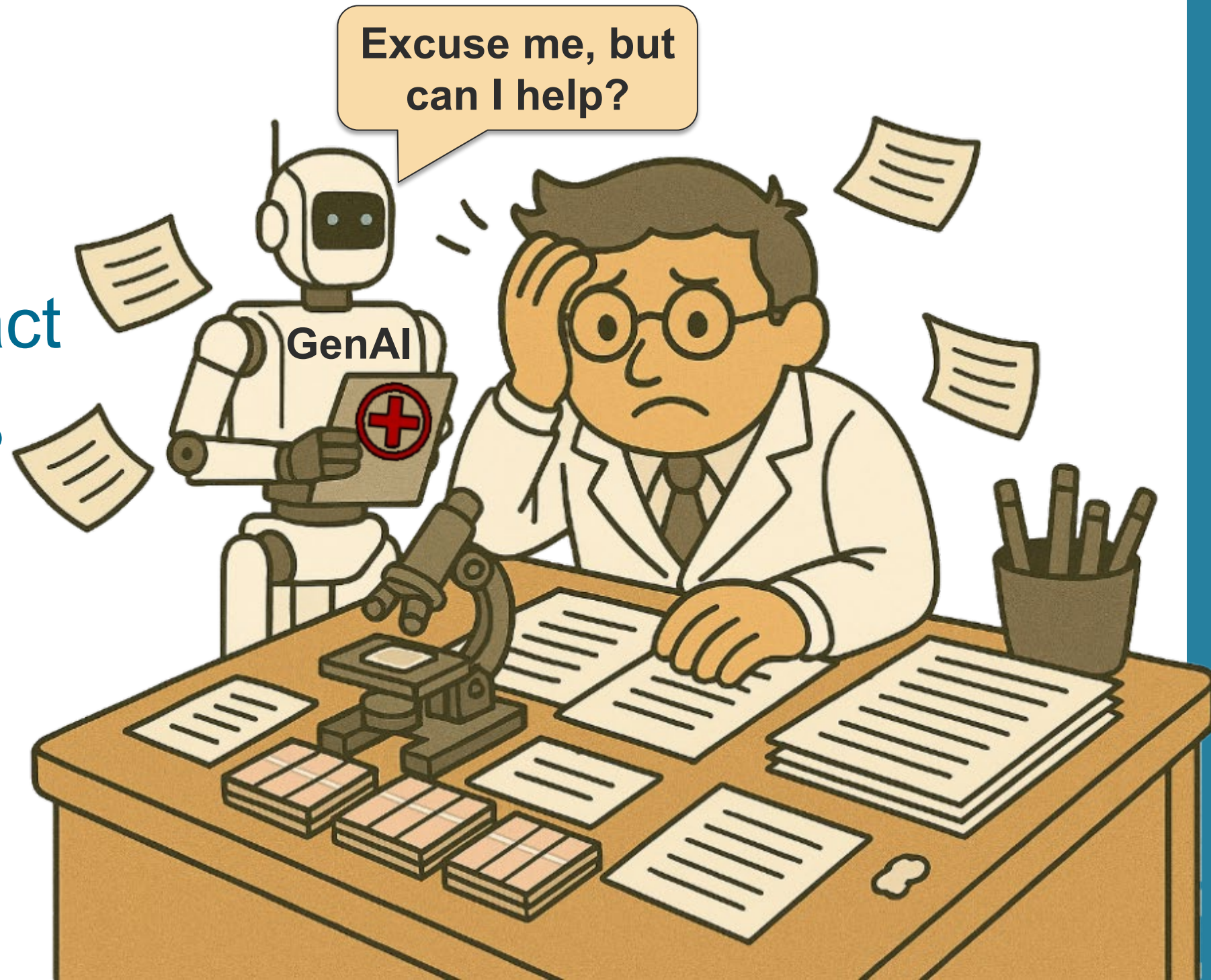
Introduction



What can GenAI do for me
outside of the diagnostic realm?

Introduction

Can GenAI be my
“desktop assistant” or act
as a medical assistant?



Introduction



Can GenAI make me more efficient? Alleviate my burnout?

Can it...

...prepopulate data, format reports and synoptics, code, order stains, screen final drafts, etc?

Introduction

Can GenAI do what
Nuance DAX ambient
listening medical scribe
does for clinical
encounters?



Unlocking GenAI's Potential to Streamline Pathology Practice

- Rethinking AI in pathology
- Practical benefits, current & future potential
- Enhancing job satisfaction and retention, as well as alleviating burnout

Beyond Diagnostics: How Might GenAI Support Pathologists

AI isn't just about replacing or enhancing diagnostic tasks—it's a powerful tool to enhance and streamline pathology workflows.

Beyond Diagnostics: How Might GenAI Support Pathologists



- Workflow optimization
 - Automated triage
 - Clinical data aggregation
 - Case prioritization & sorting
 - Ordering additional studies
 - Improving turnaround time

- Generating synoptic reports, formatting, scrubbing errors, etc

- Improving efficiency
- Reducing errors
- Generating “digital” or virtual stains
- Supporting teaching and training

- Reducing admin burden

- Improving overall job satisfaction

Today's Objectives

Identify **nondiagnostic applications** of AI that can enhance efficiency in anatomic pathology workflows.

Describe how AI tools such as automated documentation systems (eg, DAX) and report formatting solutions can **reduce administrative burden** and improve accuracy.

Evaluate opportunities to integrate AI into routine pathology tasks, including synoptic reporting, clinical data aggregation, and report prepopulation.

Discuss the potential impact of AI on time management, error reduction, and overall **job satisfaction** for pathologists.

Describe applications of generative AI for creating **digital stains** and discuss potential integration into future pathology workflows.

Explore future directions and considerations for implementing AI solutions in pathology practices beyond billing and diagnostics.

Dibson Dibe Gondim, MD, FACP

- Member of the Artificial Intelligence Committee, CAP
- Vice Chair of Computational Pathology and Artificial Intelligence at the University of Louisville
- Director of Pathology Informatics and Associate Professor of Pathology at the University of Louisville
- Certified by the American Board of Pathology in:
 - Anatomic Pathology
 - Neuropathology
 - Clinical Informatics
- Lead on the large-scale digital pathology and AI Initiative at the University of Louisville



Dr. V.K. Cody Bumgardner, PhD

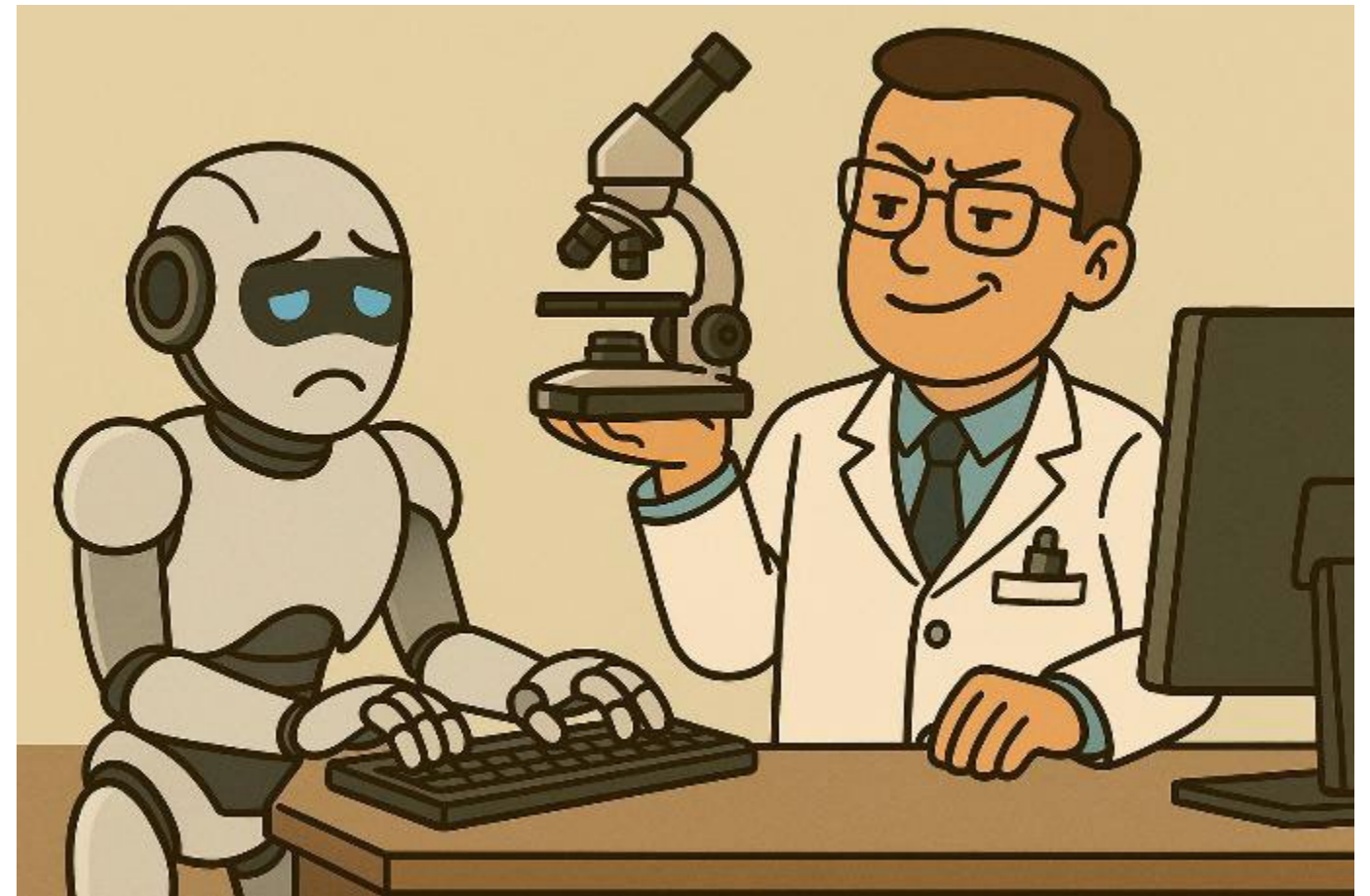
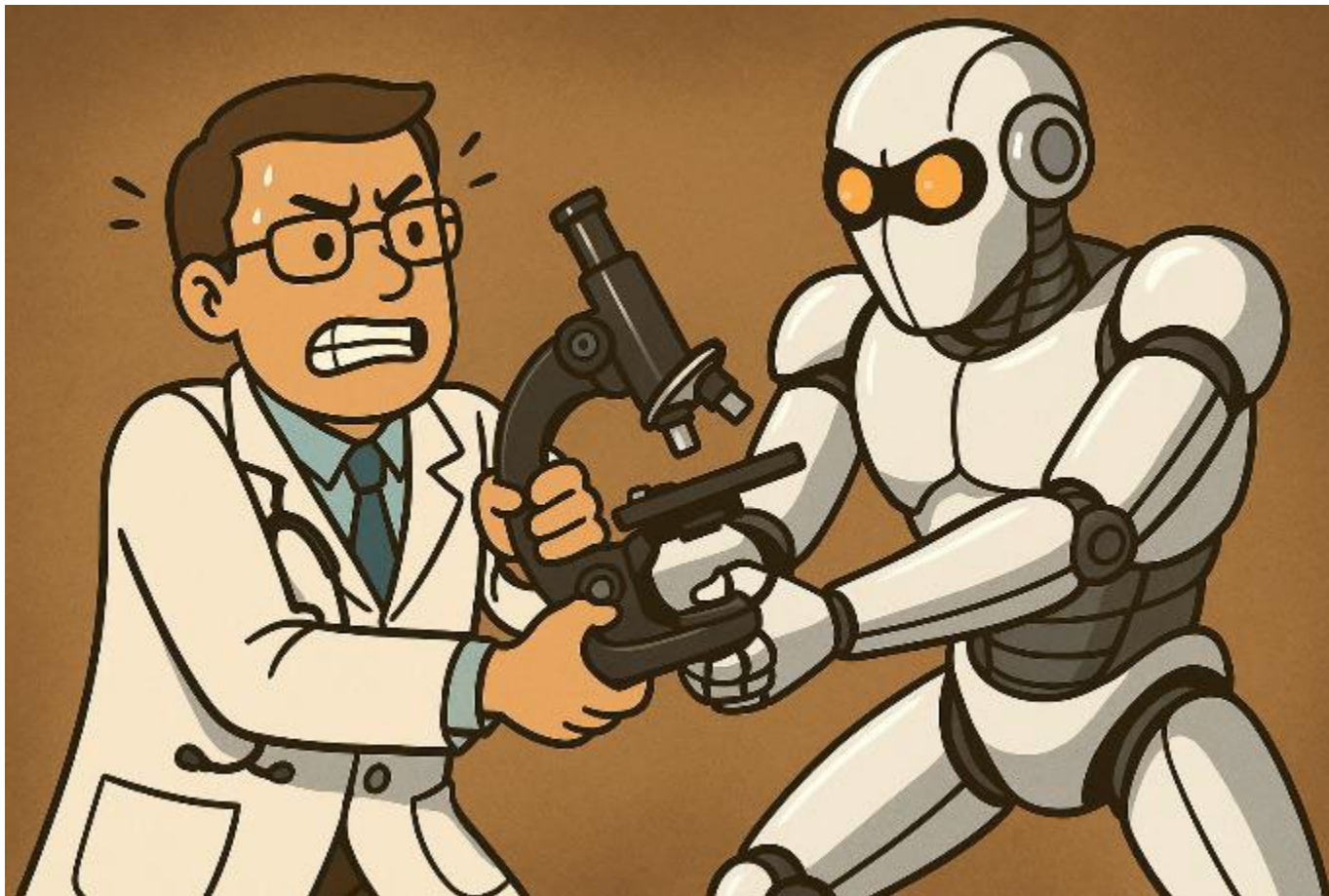
- Associate Professor of Pathology and Laboratory Medicine
- Assistant Dean for Artificial Intelligence and Data Science at University of Kentucky
- Director of Pathology Informatics at University of Kentucky
- Director of the Center for Applied Artificial Intelligence at University of Kentucky
- Research areas of interest
 - Medical Informatics
 - Distributed Systems
 - Platforms for Learning Health Systems



Generative AI Holds Incredible Potential to Bring Efficiencies to Pathology

- What is Generative AI (GenAI) and LLMs?
- Pathologist's responsibilities
- How LLMs can support future use cases and practical applications
- We will also discuss how generative AI techniques, such as GANs, can help bring the concept of digital stains to life

*Ask not whether AI can replace you —
ask what AI can do for you.*



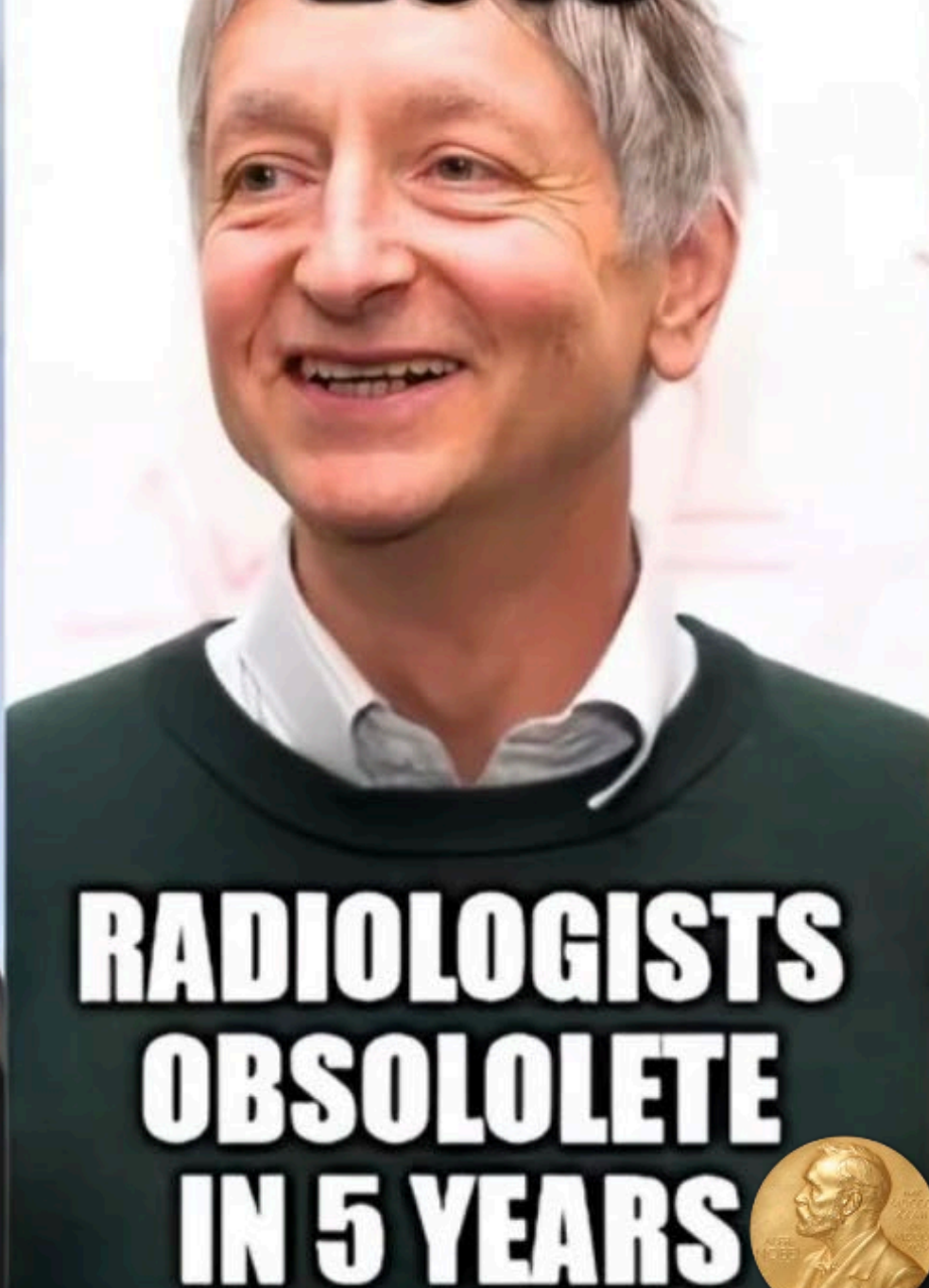
2015



**SELF-DRIVING
CARS IN 2 YEARS**

CausalPython.io

2016



**RADIOLOGISTS
OBSOLETE
IN 5 YEARS**



2024



**RADIOLOGISTS
IN REGULAR CARS
DRIVING TO WORK**

**“It's difficult to make predictions,
especially about the future”**

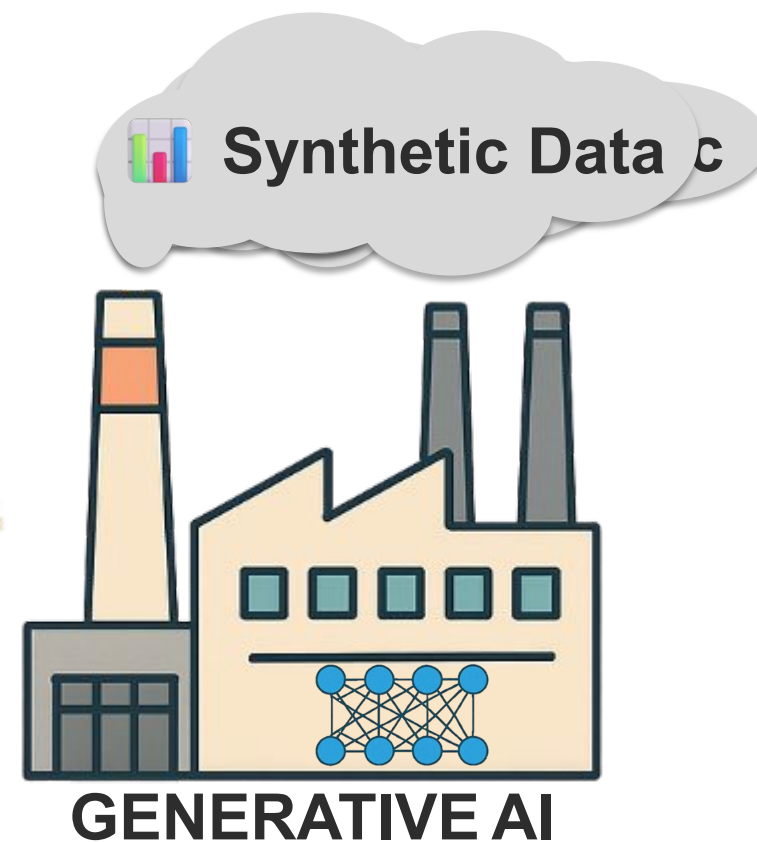
Attributed to Niels Bohr

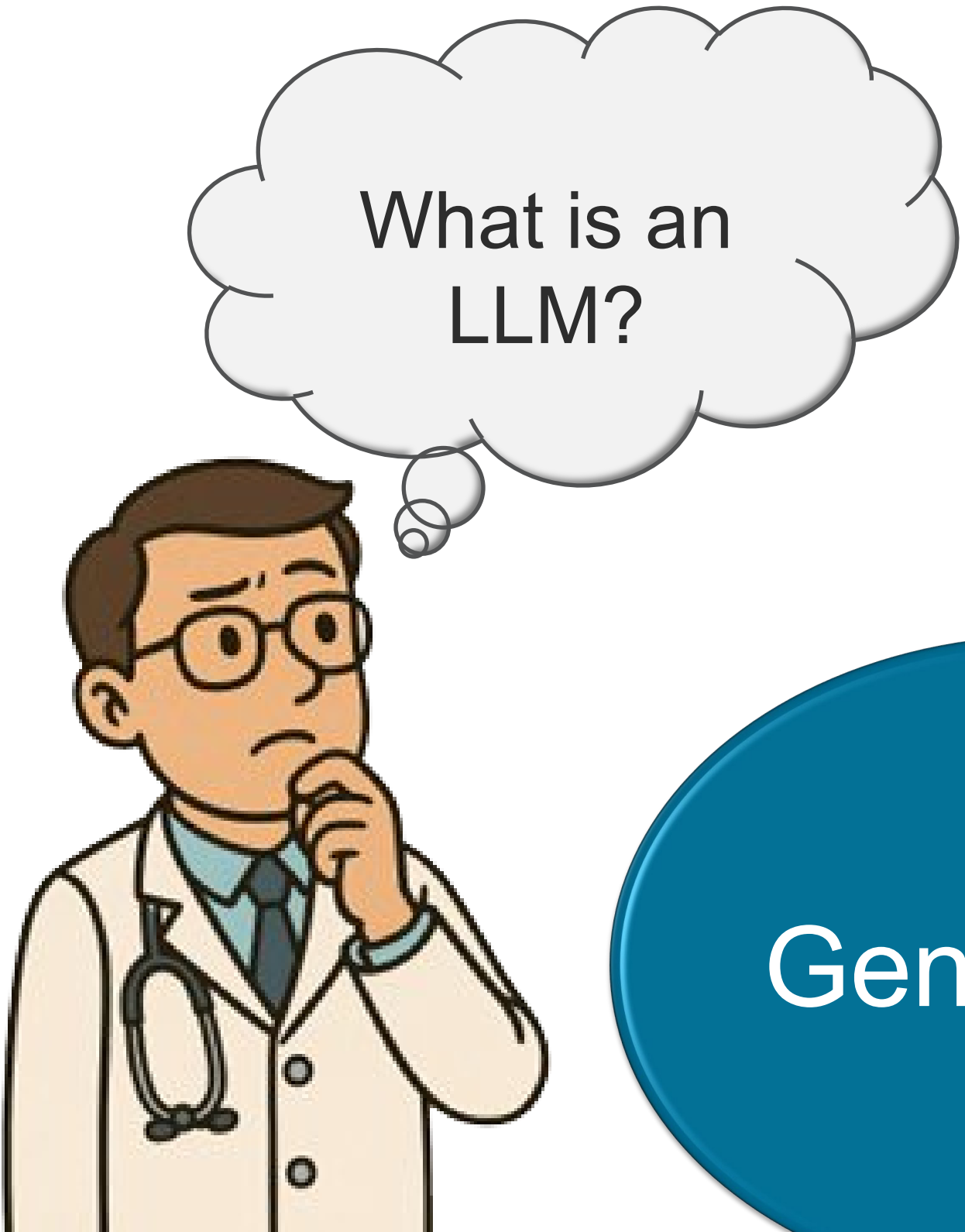
Definitions

What is
Generative
AI?

Generative AI (GenAI)

- Creates new content
- Patterns learned from vast datasets





What is an
LLM?

Large Language Model

- Generate text
- Summarize text
- Edit text
- Text comprehension
- (long list of functionalities)



GenAI

LLM

Prominent Example:



ChatGPT

Generative AI (GenAI)

The Moment it Took the World by Storm

2014: GANs introduced



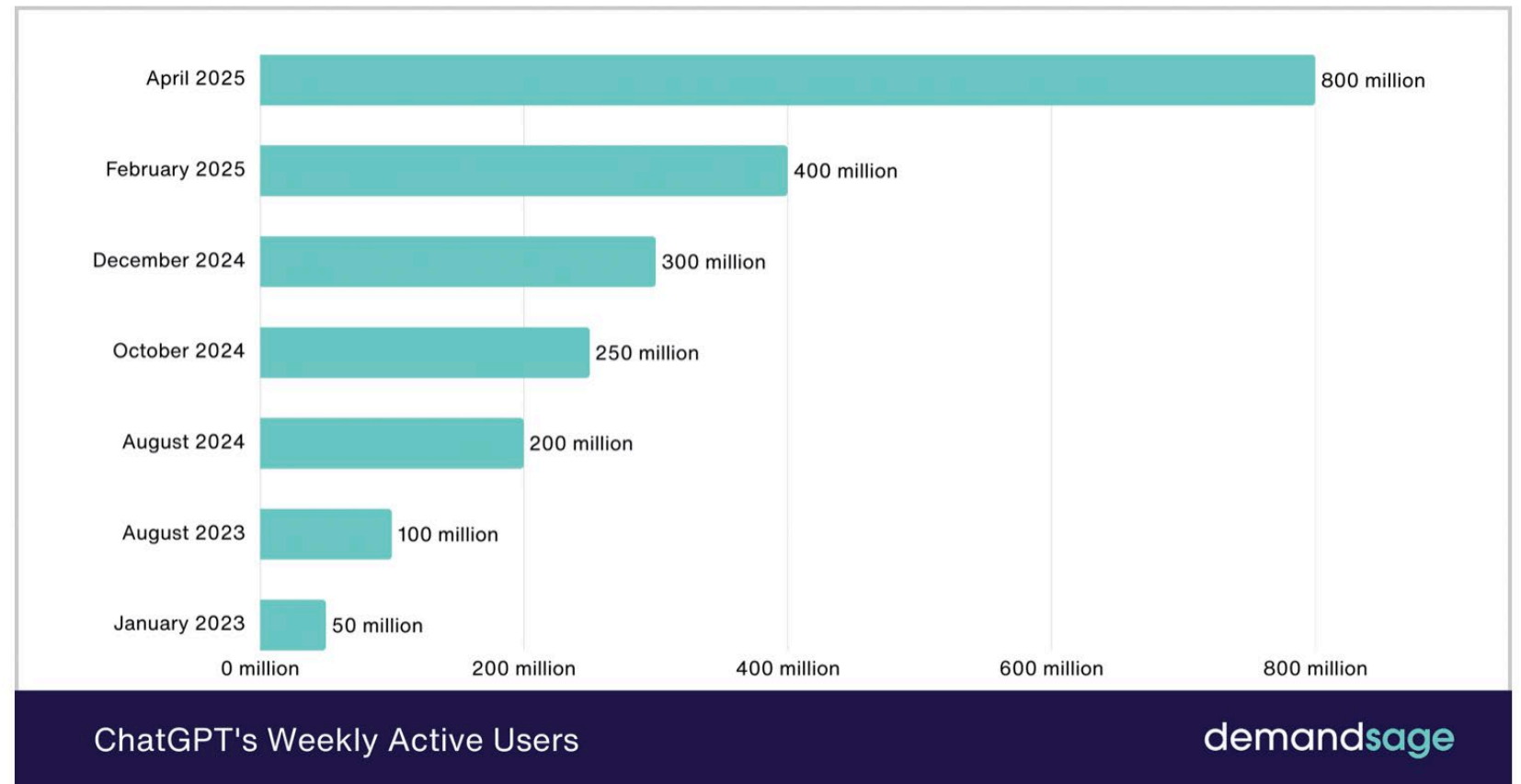
2020: GPT-3 release sparks interest



2022: ChatGPT launched
→ Popularization moment



ChatGPT

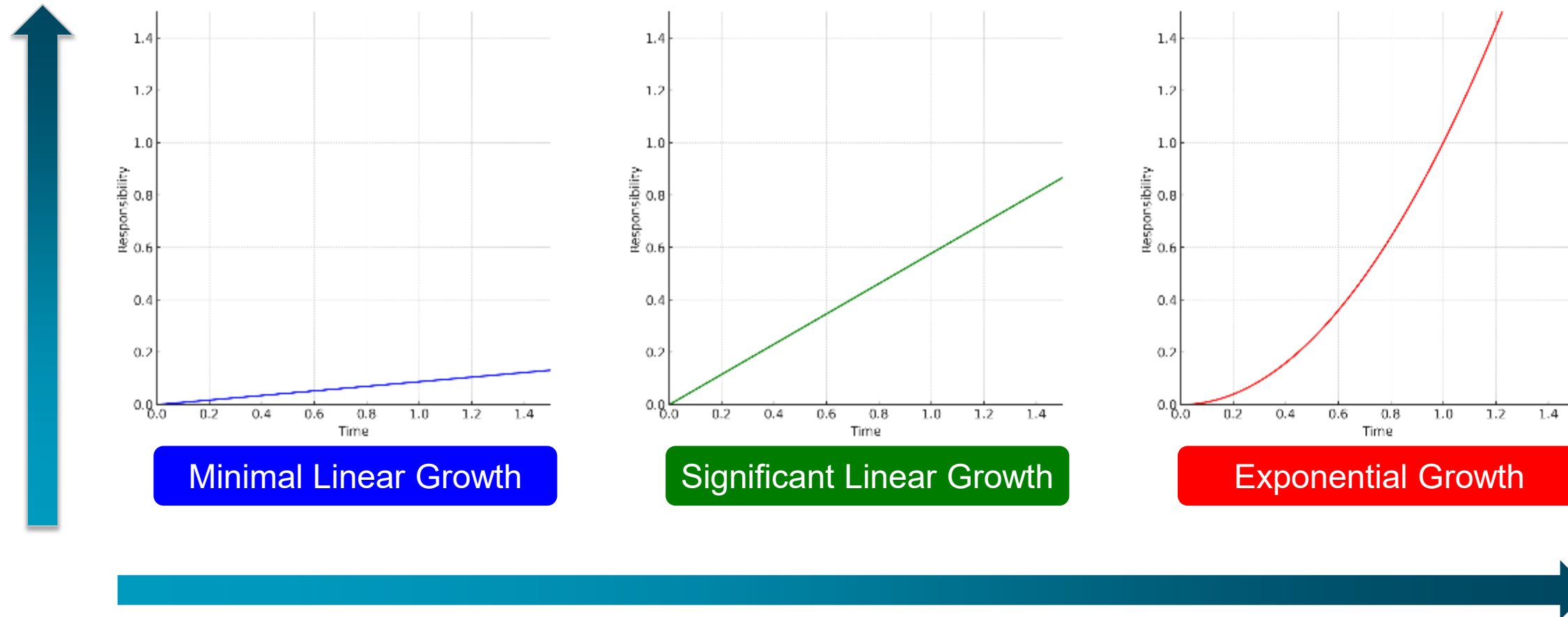


Pathologist's Responsibilities

- Pathology is a complex profession
- The number of responsibilities, case complexity, and regulatory aspects is higher than ever and ever-growing

Ever-growing Responsibilities

The challenge isn't if, but how fast responsibilities expand



RESPONSIBILITY GROWTH RATE



Life Beyond Reading Slides...

Pathologists' obligations and responsibilities extend far beyond slide interpretation.

Early industry focus: diagnostic AI applications

Is this truly the area that delivers the most immediate impact for pathologists?

Does it significantly improve productivity?

Were these applications ever on pathologists' wish list?

Diagnostic Activities

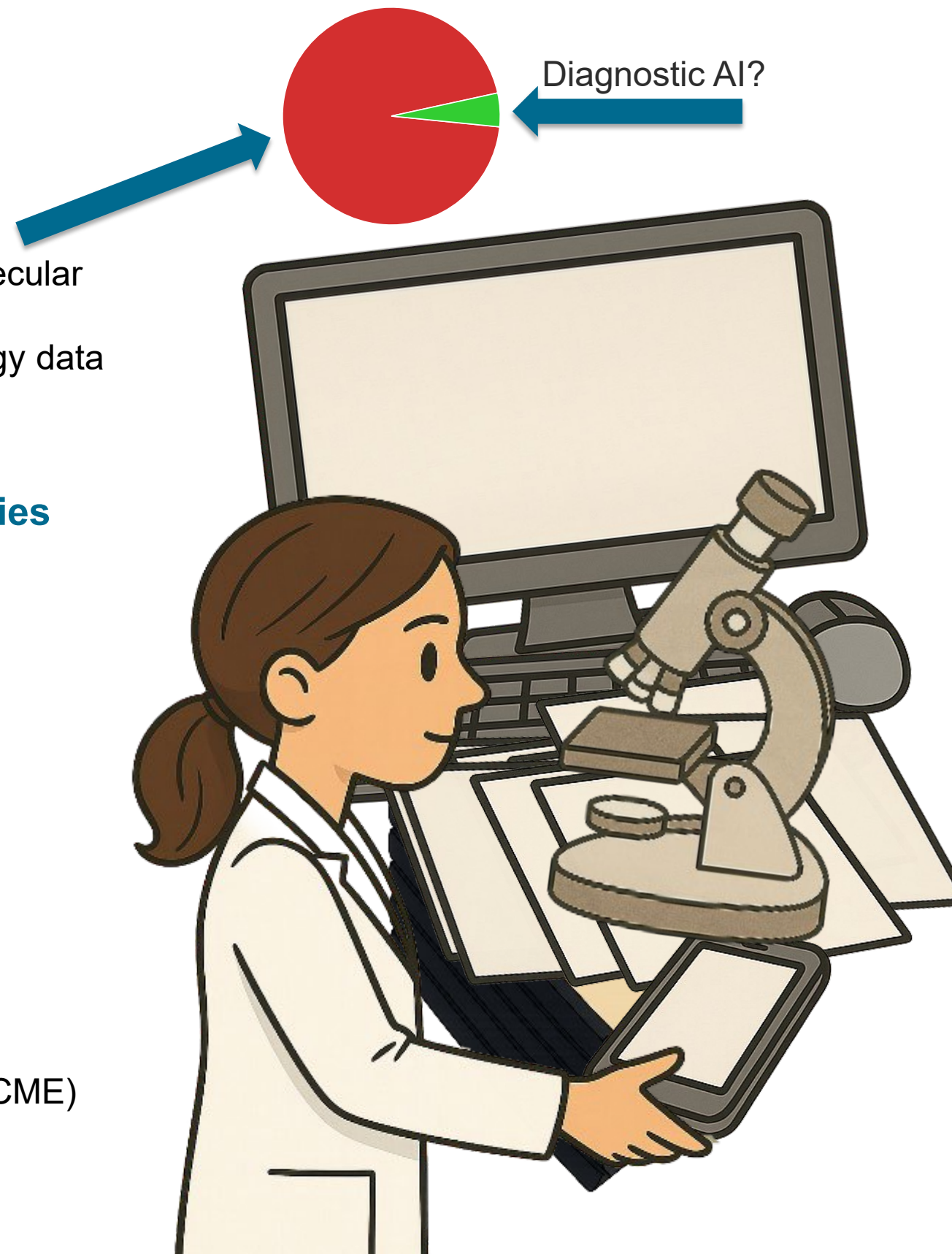
- Case reviews
- Diagnostic slide evaluation
- Ancillary testing (e.g., IHC, molecular requests)
- Correlation with clinical/pathology data
- Communication with clinicians

Clinical & Administrative Duties

- Tumor boards × 3
- Staff evaluation
- Quality assurance (QA)
- Directorships
- Random requests
- Emails
- Meetings

Education & Training

- Resident education
- Resident evaluation
- Professional development
- Continuing medical education (CME)
- Surveys



Inefficiencies

- Delayed slide deliveries
- Suboptimal IT systems
- Managing conflicts

Compliance & Credentialing

- Hospital credentialing
- Board continued accreditation
- Proof of vaccination
- TB annual testing
- Updated CV

Committees & Recruitment

- Recruitment
- Committees
- Interviews

Research & Scholarly Activity

- Publications
- Peer Review
- Lectures

Shortages

- While shortages are less severe in the US, they persist in certain locations
- What solutions could GenAI offer?

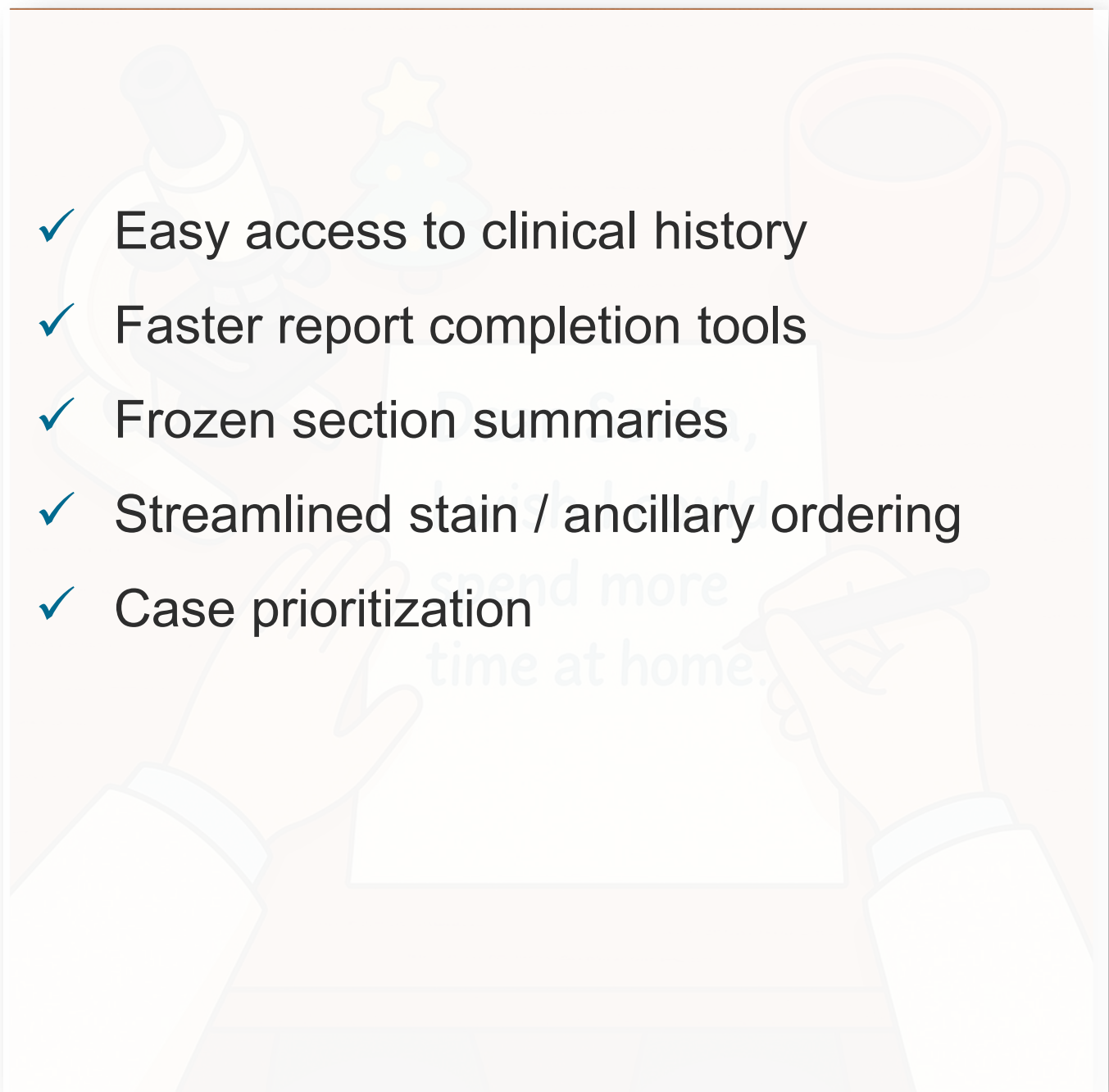


The Royal College of Pathologists
Pathology: the science behind the cure

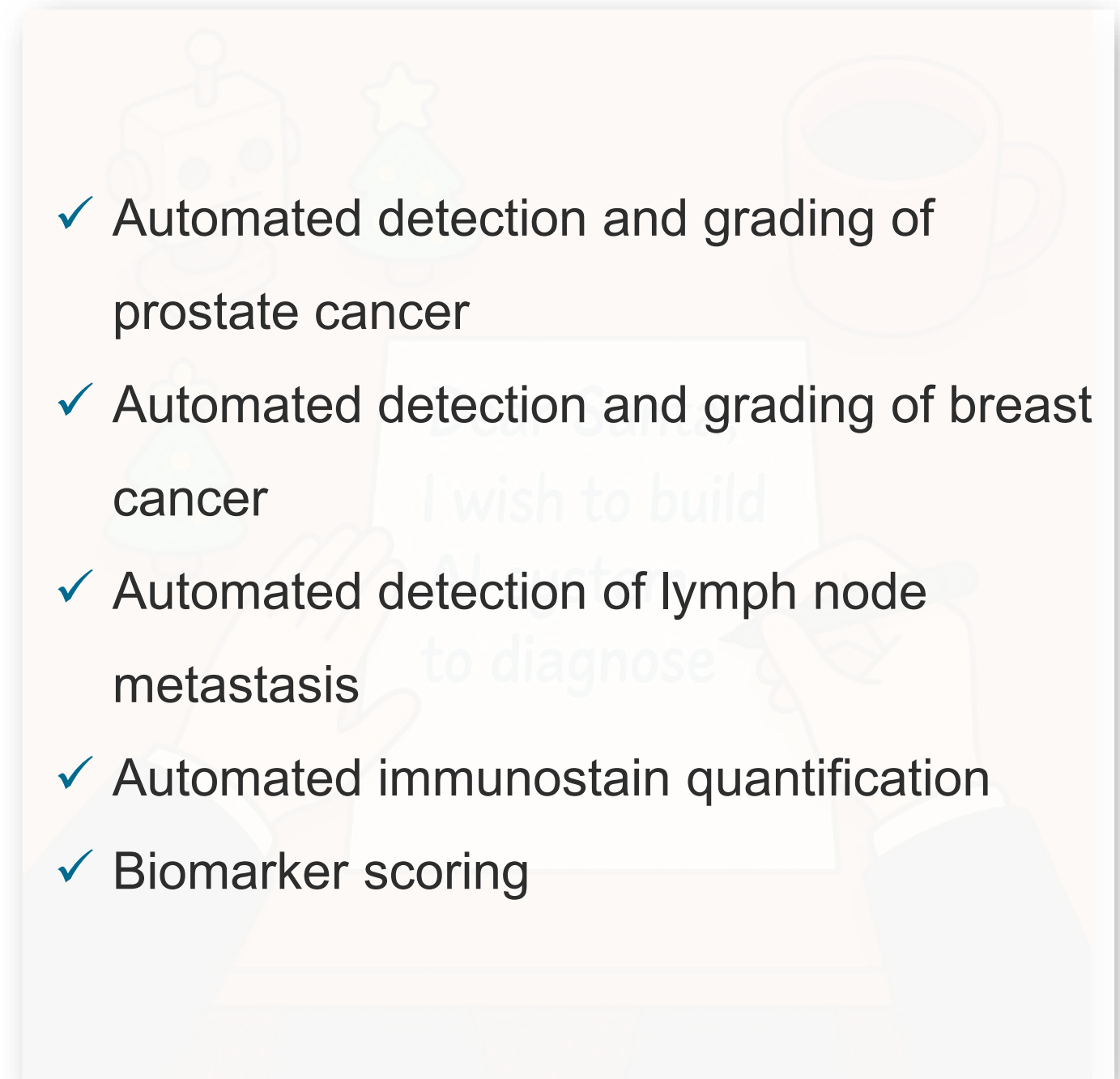
**COLLEGE REPORT FINDS UK WIDE
HISTOPATHOLOGY STAFF SHORTAGES**

**97% of NHS
departments**

**Shortage
(RCPATH 2018)**

- 
- ✓ Easy access to clinical history
 - ✓ Faster report completion tools
 - ✓ Frozen section summaries
 - ✓ Streamlined stain / ancillary ordering
 - ✓ Case prioritization

PATHOLOGISTS

- 
- ✓ Automated detection and grading of prostate cancer
 - ✓ Automated detection and grading of breast cancer
 - ✓ Automated detection of lymph node metastasis
 - ✓ Automated immunostain quantification
 - ✓ Biomarker scoring

AI INDUSTRY



How Ambient AI Transforms Clinical Documentation

Applying Ambient AI to Pathology Workflows

Ambient AI for Clinical Documentation



Opinion

Leana S. Wen (+)

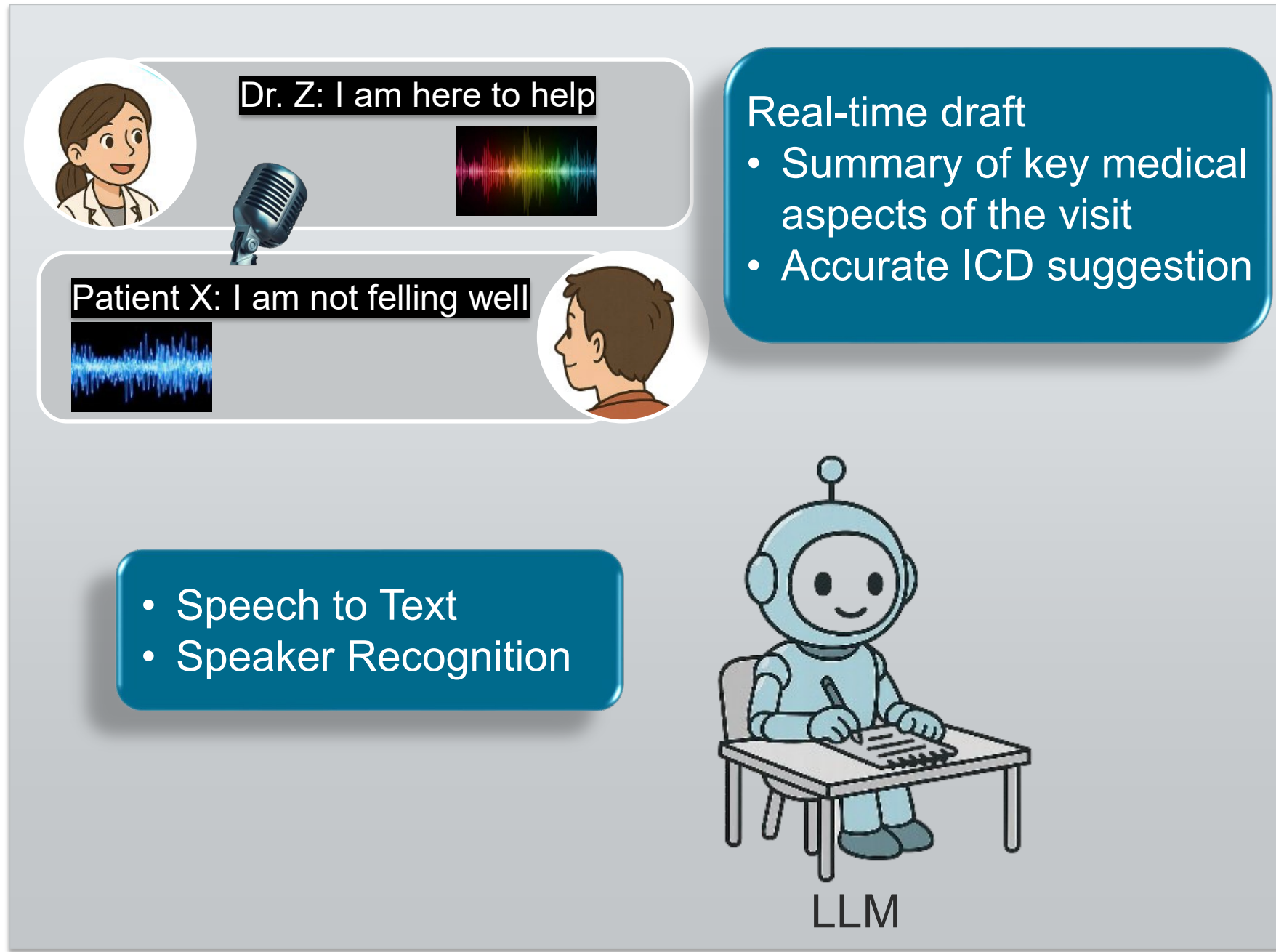
The Washington Post
Democracy Dies in Darkness

This technology is becoming beloved by doctors and patients alike

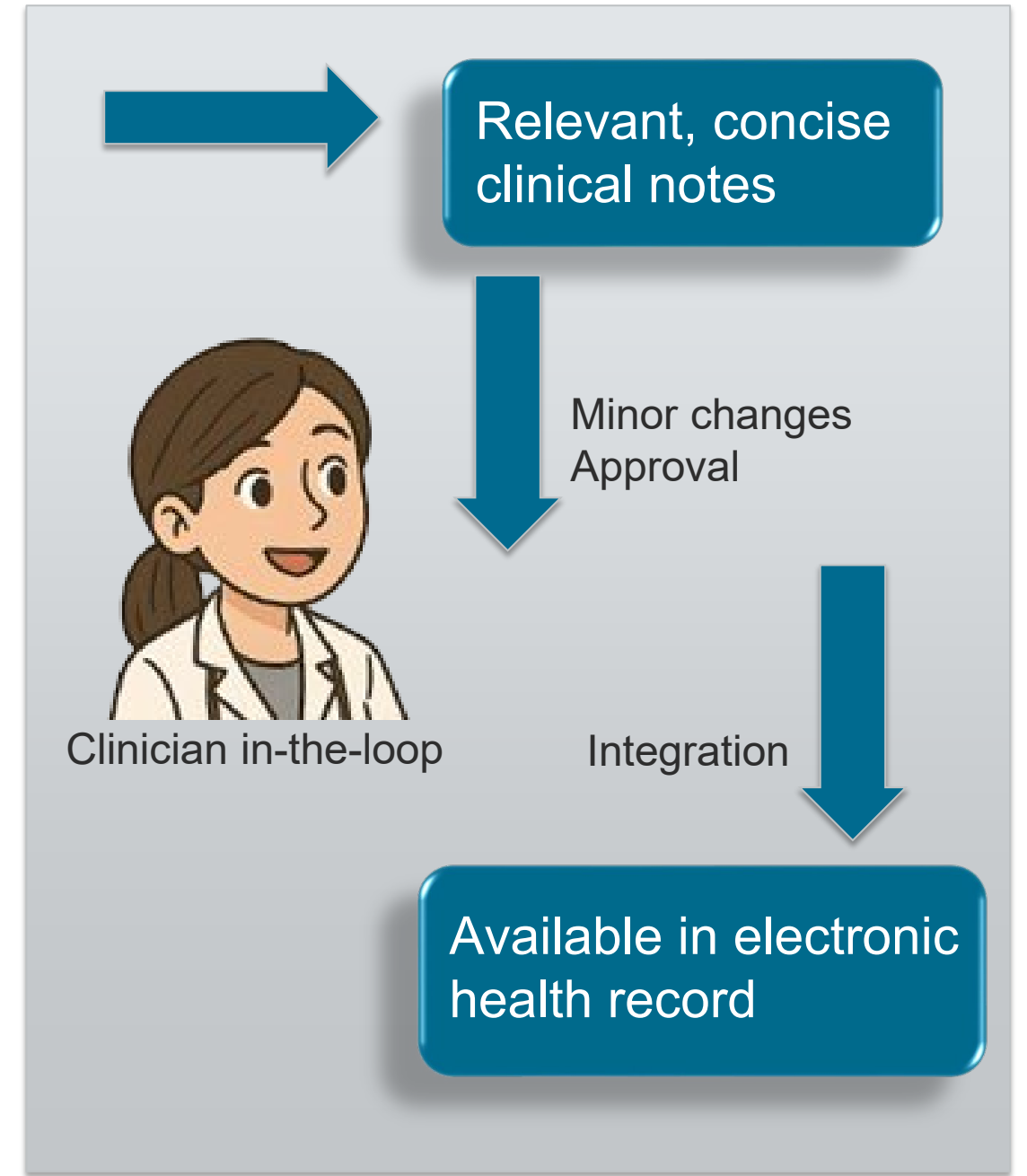
How artificial intelligence is helping medical professionals save time and reduce burnout.

March 25, 2025

How Ambient AI Works



Visit



After visit

Study Overview: 100 clinicians (53% male, average age 49) participated in this study examining the effects of ambient AI technology on clinical work.

Mental Workload Improvements

All measures showed **significant improvements** ($p < 0.001$):

Mental demand for note writing: Dropped from 12.2 to 6.3

Feeling hurried/rushed: Decreased from 13.2 to 6.4

Effort required for notes: Reduced from 12.5 to 7.4

Job Satisfaction by Specialty

Percentage reporting improved work satisfaction:

- Primary Care: 85.8% (33 of 38 clinicians)
- Medical Subspecialties: 36.4% (4 of 11 clinicians)
- Surgical Subspecialties: 50.0% (4 of 8 clinicians)

Time Savings

Time spent on notes per appointment decreased from 6.2 to 5.3 minutes ($p < 0.001$)

Gender Differences in Time Savings:

- Female clinicians: 8.1 → 6.7 minutes (bigger reduction)
- Male clinicians: 4.7 → 4.2 minutes (smaller reduction)

Burnout Results

Burnout decreased from 42.1% to 35.1% of clinicians, though this change was not statistically significant ($p = 0.12$).

Stults, Cheryl D., et al. "Evaluation of an ambient artificial intelligence documentation platform for clinicians." *JAMA Network Open* 8.5 (2025): e258614-e258614.

46

CLINICIANS

17

MEDICAL SPECIALTIES

11.1

MEAN YEARS EXPERIENCE

Documentation Time Reduction

-20.4%

Less time spent on notes per appointment

Claude content

BASELINE

10.3 min



POST-INTERVENTION

8.2 min

P < .001 (Highly Significant)

Same-Day Closure Improvement

+9.3%

Greater same-day appointment closure rate

BASELINE

66.2%



POST-INTERVENTION

72.4%

P < .001 (Highly Significant)

After-Hours Work Reduction

-30.0%

Less after-hours work time per workday

BASELINE

50.6 min



POST-INTERVENTION

35.4 min

P = .02 (Significant)

Less pajama time!



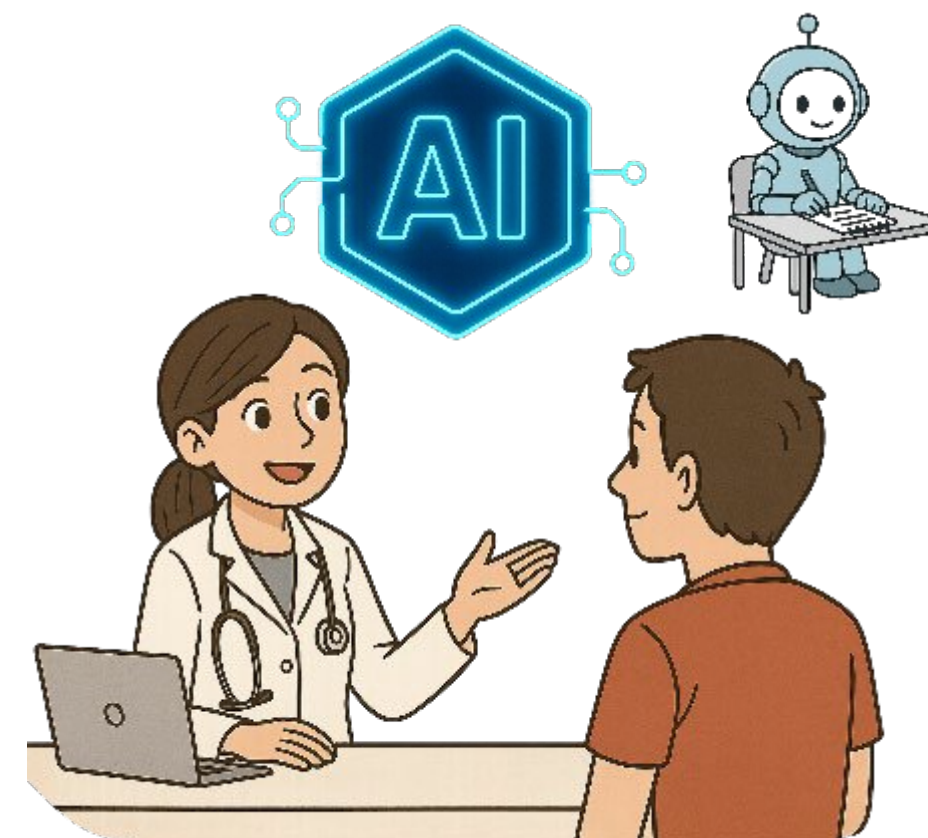
How could I leverage this for pathology ?



Decreased
non-clinical
workload



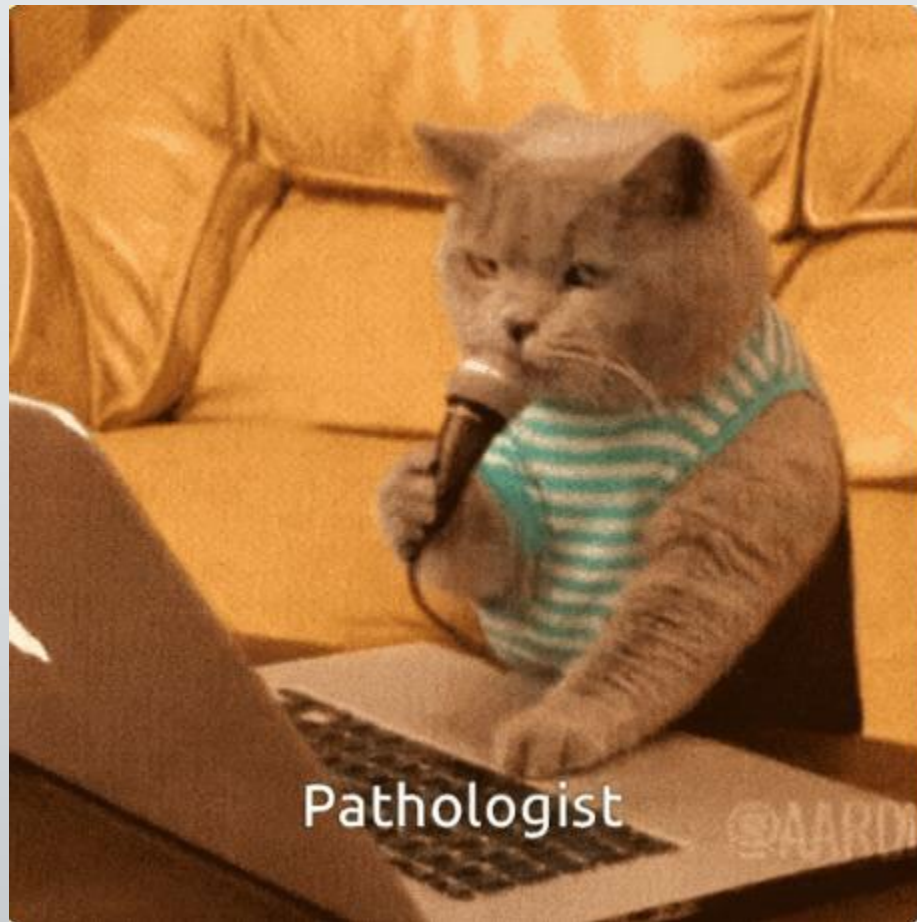
Improved
patient
experience.



GenAI powered

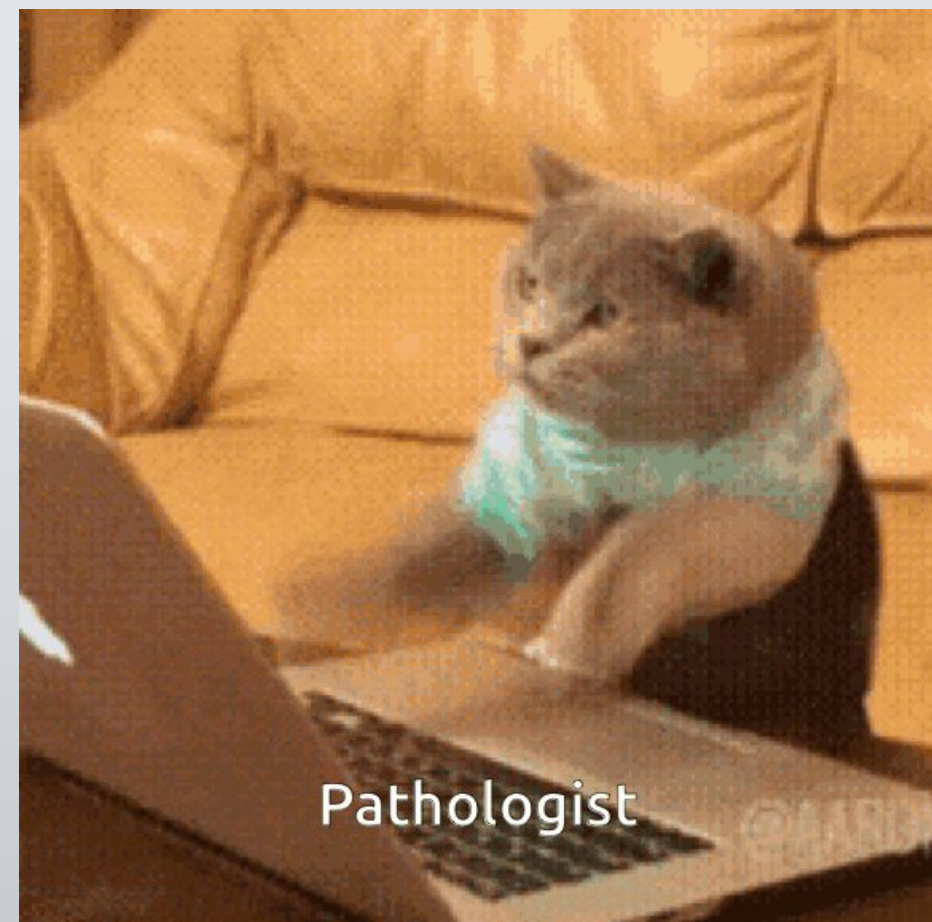
State of Pathology Reporting 2025

Support



Transcriptionist or dictation
software available
(but still requires numerous mouse
clicks and keyboard commands)

Limited support



No transcriptionist
No dictation software
No templates

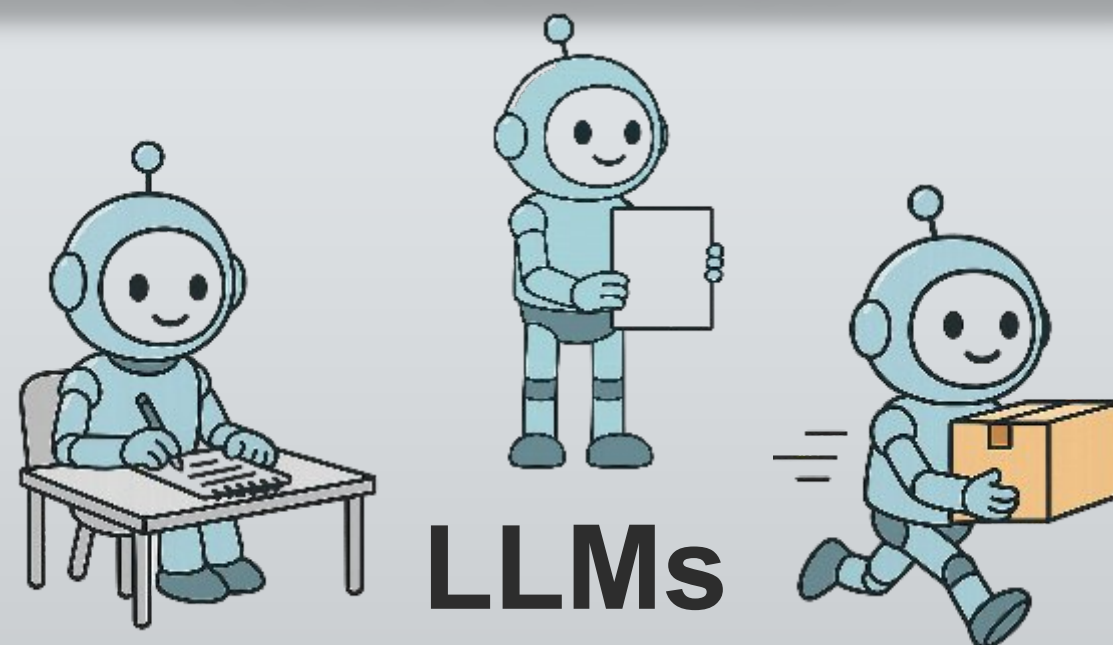
Aspirational, But Possible Today – Agentic/LLMs

Ambience AI for Pathology

Fill synoptic report for colon cancer pT2, 4 lymph nodes involved, negative margins order MSI, and let me know when MSI stains are ready



Voice workflow



LLMs

Summary
Report Draft
Report Creation
Ordering stains
Reminders

Aspirational, But Possible Today – Agentic/LLMs

Ambience AI for Pathology

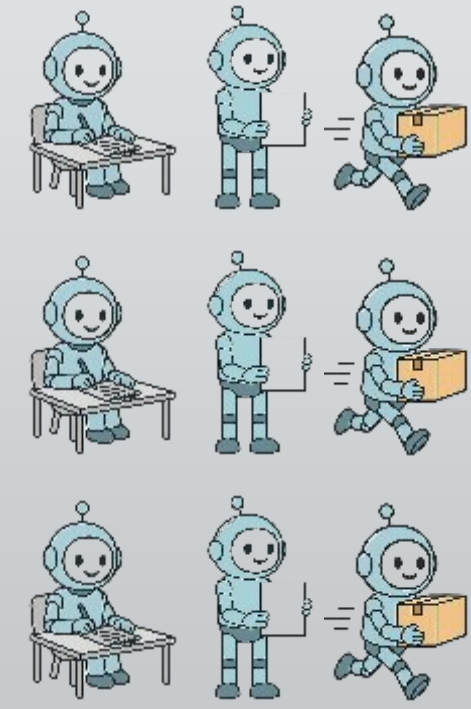
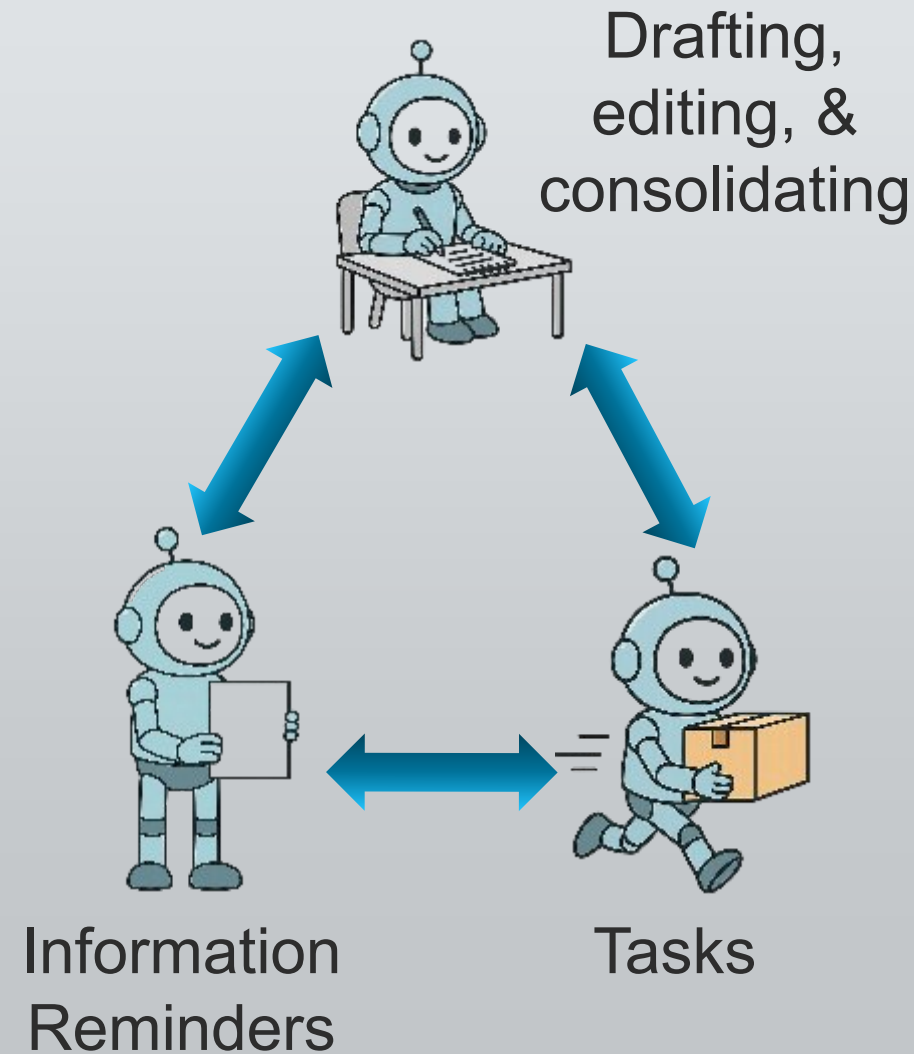


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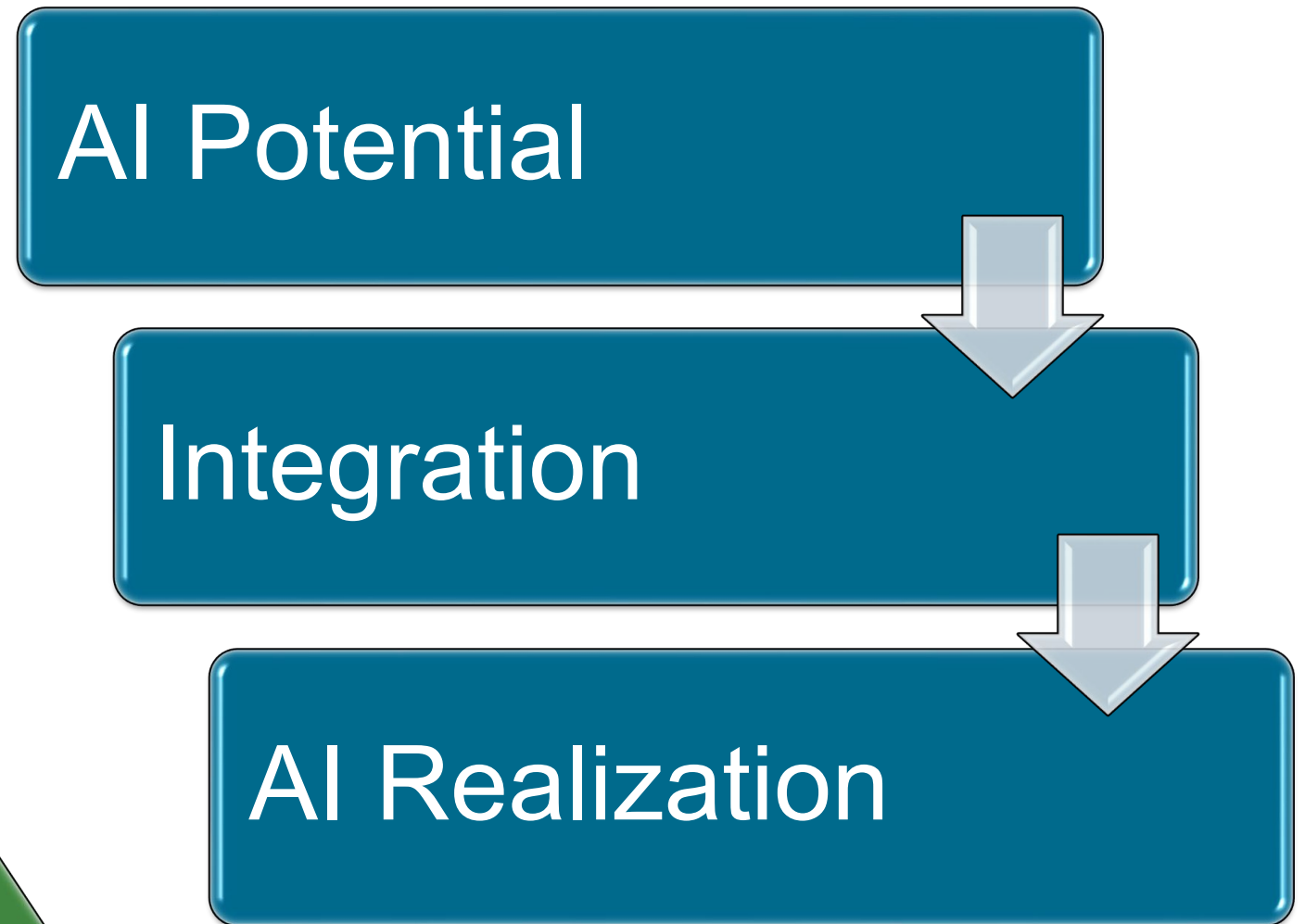
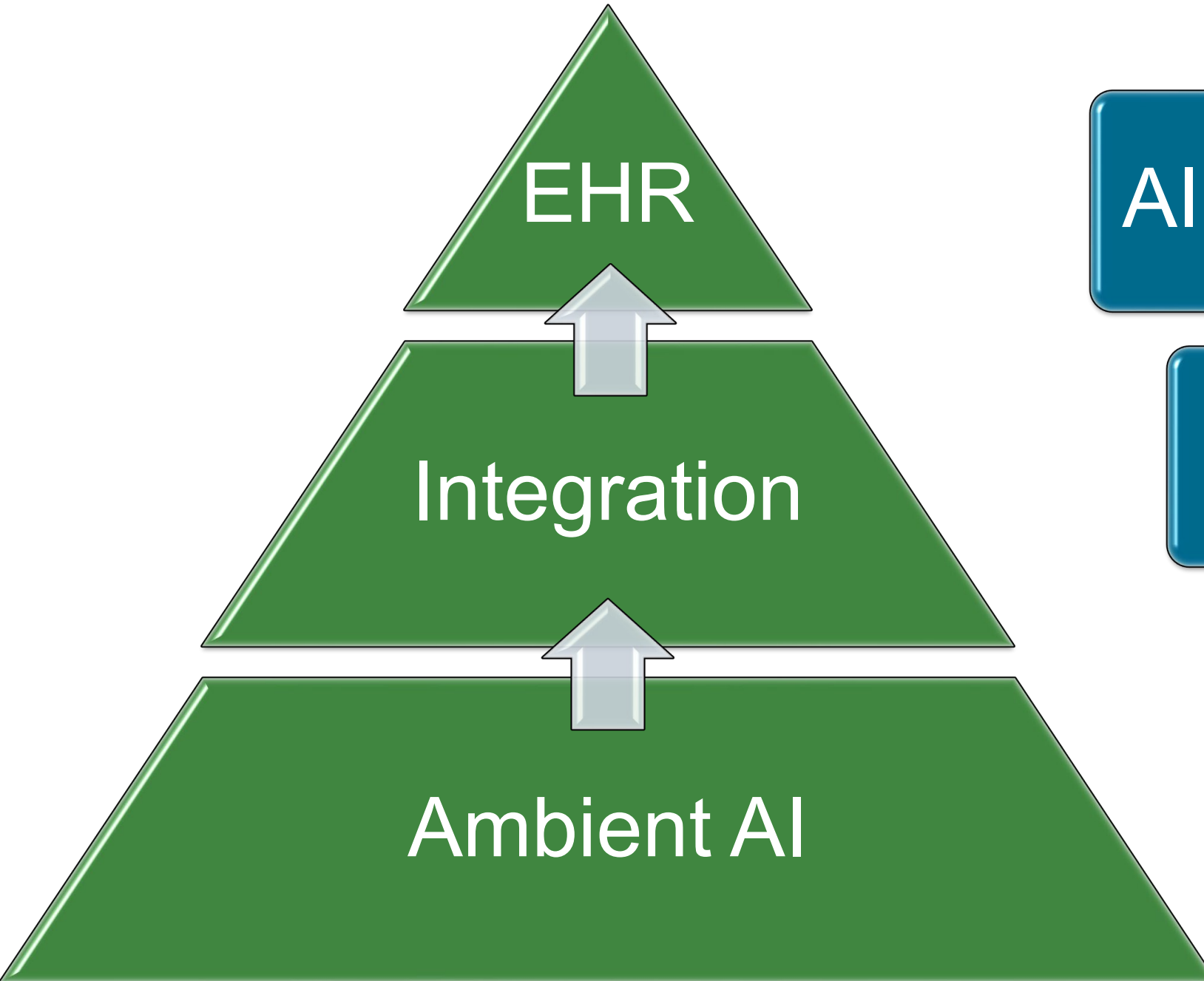


Digital Pathology

Voice workflow



Integration = Key Features That Enable Ambient AI Functionality



How Integration Converts GenAI into Real Impact



Level 0: Experimentation

Copy & Paste

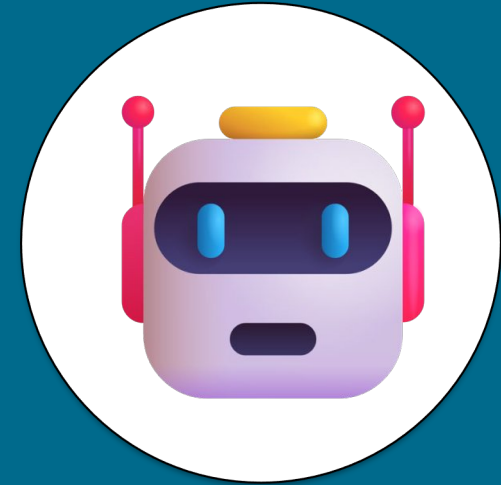
- Fast experimentation
- Low cost
- No streamlined workflow



Level 1: Integration

User-Selected Prompts with API Integration

- Users choose from predetermined prompts
- Requires API integration (higher cost, maintenance)
- Enables streamlined workflow



Level 2: Automation

Automated AI Selection

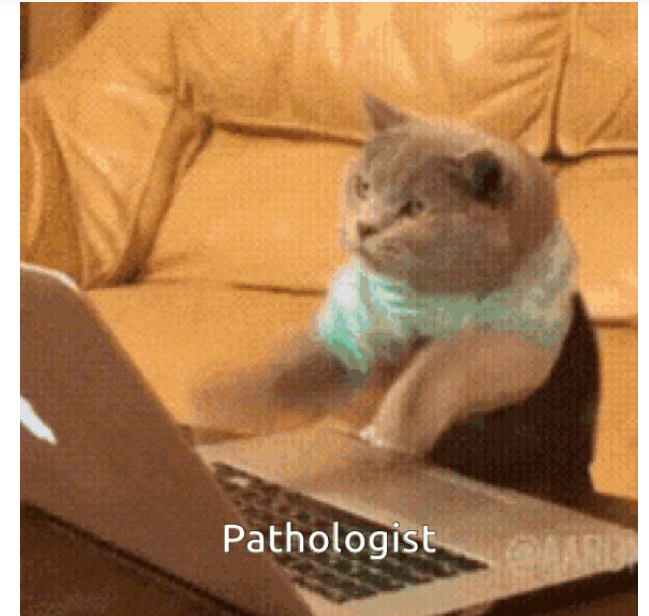
- AI autonomously selects prompts/tasks (no user input)
- Seamless integration
- Optimal streamlined workflow

Asking Vendors About Integration!

Integration



Likely Outcome





GenAI - Automated Summarization





NEWS

AI can Outperform Humans in Writing Medical Summaries

nature medicine

Article

<https://doi.org/10.1038/s41591-024-02855-5>

Adapted large language models can outperform medical experts in clinical text summarization

Current Approach

**PATHOLOGY
REQUISITION FORM**

John Doe, 38yo

INDICATION:
LFTs

Liver biopsy



 **Laboratory Tests**
LFTs, Viral Serology, Autoimmune

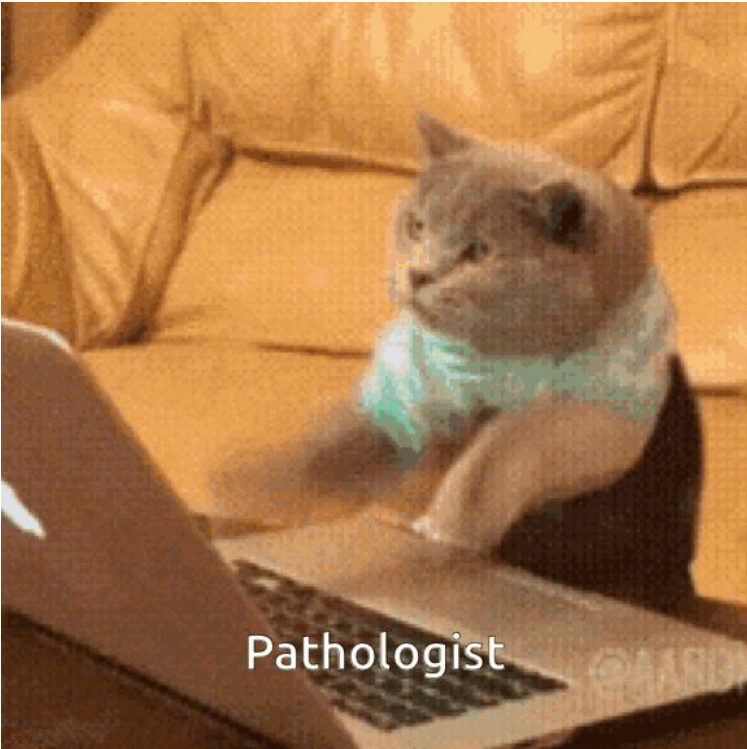
 **Medical Imaging**
Ultrasound, CT, MRI Findings

 **Genetic Testing**
Wilson's, Hemochromatosis

 **Medication History**
Hepatotoxic Drugs, Alcohol

 **Previous Biopsies**
Serial Assessment Data

EHR Expedition
(Electronic Health Records)



Pathologist



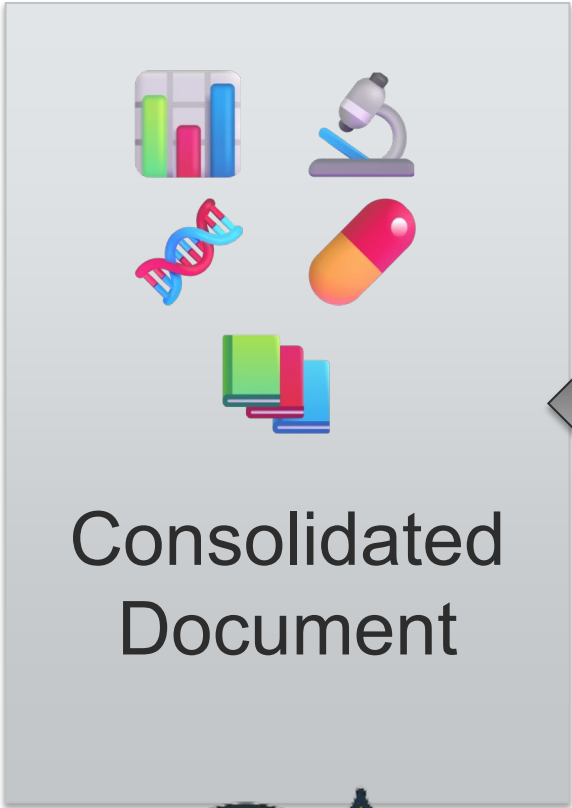
AI Summarization Approach

**PATHOLOGY
REQUISITION FORM**

John Doe, 38yo

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LFTs

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LFTs, Viral Serology, Autoimmune



Medical Imaging

Ultrasound, CT, MRI Findings



Genetic Testing

Wilson's, Hemochromatosis



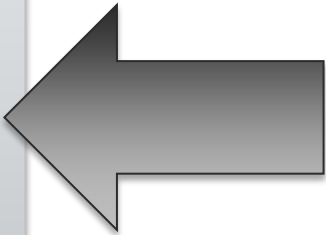
Medication History

Hepatotoxic Drugs, Alcohol



Previous Biopsies

Serial Assessment Data



LLMs

Information Available

Information Needed

LLM Processing Pipeline



Laboratory Tests

LFTs, Viral Serology, Autoimmune



Medical Imaging

Ultrasound, CT, MRI Findings



Genetic Testing

Wilson's, Hemochromatosis



Medication History

Hepatotoxic Drugs, Alcohol



Previous Biopsies

Serial Assessment Data



Medical Text Analysis

*Clinical terminology
extraction, symptom parsing*



Differential Diagnosis

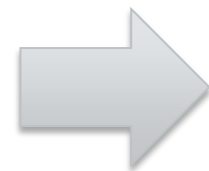
*Disease probability ranking,
etiology assessment*



Multi-Modal Fusion

*Lab-imaging-clinical
correlation analysis*

EHR Data Sources



LLM



Comprehensive
AI-assisted
Medical
Summary

LLMs – Essential to Experiment to Discover Possibilities

LLMs Exploring Use Cases



HIPAA Compliance

Never send **HIPAA-protected data** to external LLMs such as **ChatGPT**, unless your healthcare organization has established **appropriate business associate agreements** and technical safeguards in place.



Local Deployment Strategy

Explore **local LLM deployment** options where sensitive data remains within your secure infrastructure, significantly improving privacy controls and regulatory compliance.



Synthetic Data Generation

Utilize LLMs to generate **synthetic pathology reports** and anonymized medical documentation for safe experimentation, training, and workflow development without exposing real patient information.



Institutional Review and Guidelines

Always consult your **institutional guidelines** and **Institutional Review Board (IRB)** requirements before implementing LLM solutions, especially for research applications involving patient data or clinical workflows.



Ollama

www.ollama.com

Recommended Solution: Ollama enables on-premises deployment of various language models, ensuring complete data sovereignty and control.

QA – Text Discrepancies Going Beyond 10% Reports

Specimen:

Right breast, biopsy

Clinical History:

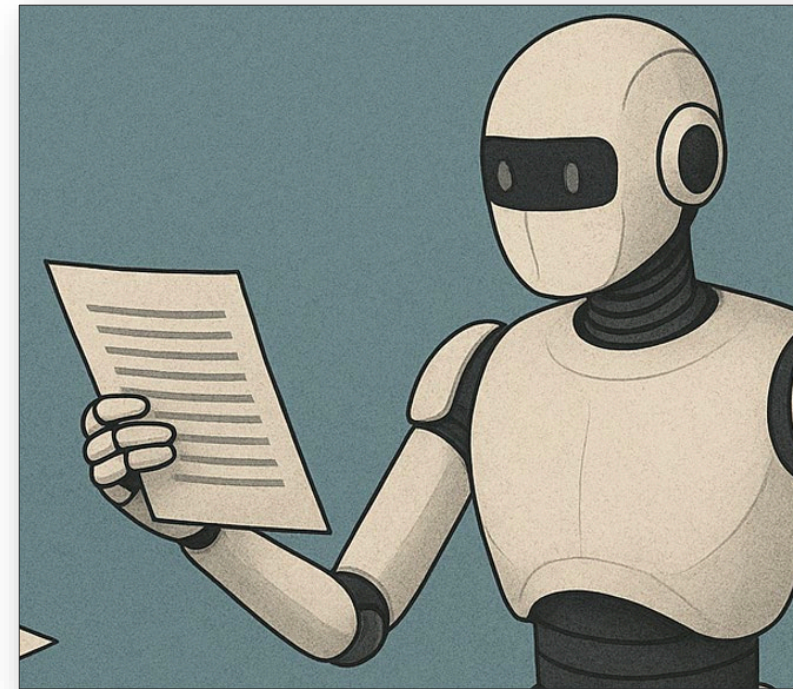
Breast mass

Diagnosis:

Breast, **left**, biopsy: Ductal adenocarcinoma

LLM output:

This kind of discrepancy is significant because laterality (right vs. left breast) directly affects **patient management and treatment decisions** (e.g., surgery, radiation therapy, targeted breast imaging). Mislabeling could result in inappropriate therapy to the wrong breast.



Reading
Discrepancy identification
Interpretation

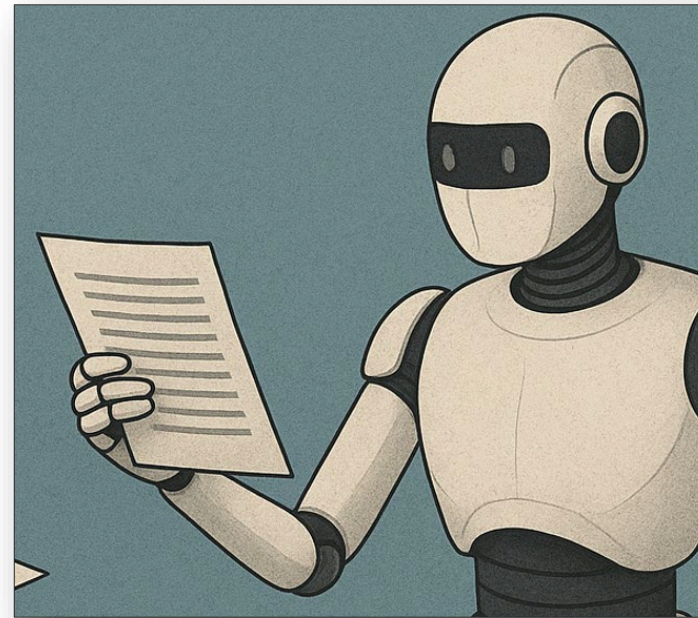
Supporting Resident Education

Resident Report (Draft)

Diagnosis (resident)

Breast, right, biopsy:

Fibrocystic changes



Diagnosis (faculty)

Breast, right, biopsy:

Ductal adenocarcinoma

LLM output: Type of Discrepancy (Classification):
Diagnostic discrepancy (benign vs. malignant).

Clinical Significance:

- Very high — misclassifying a malignant lesion as benign could lead to missed or delayed cancer treatment.

Possible Causes:

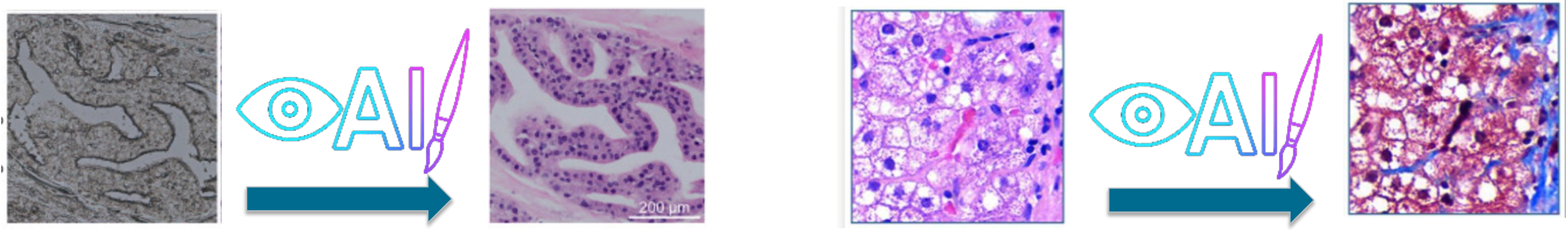
- Under-recognition of cytologic/nuclear atypia by the resident
- Over-reliance on benign background changes
- Limited diagnostic experience (common in early training)



GenAI - Unlocking Digital Stains

No More Waiting for Stains

Digital Stains



Zero Wait Time

Instant results eliminate traditional staining delays and improve diagnostic turnaround times



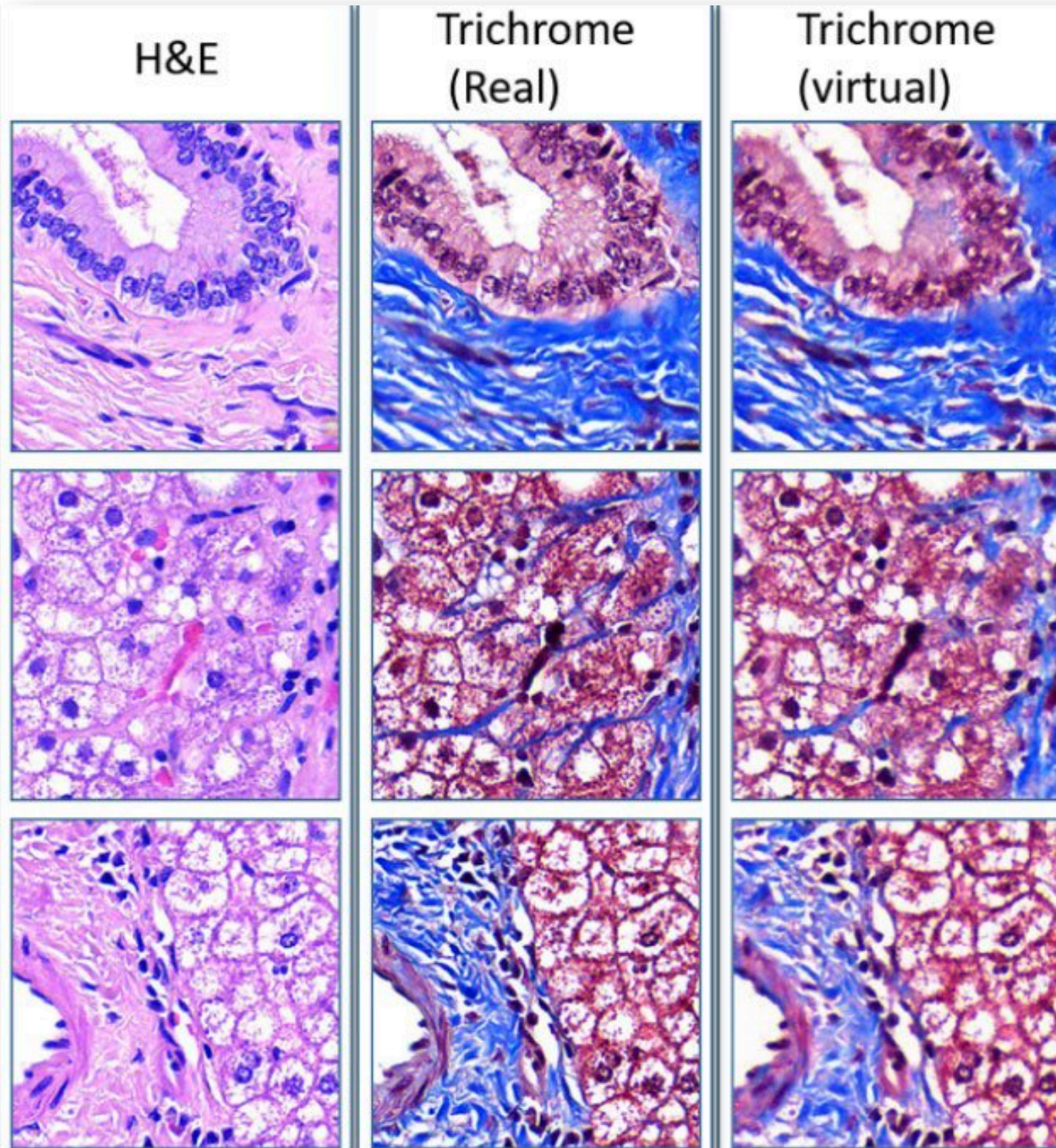
Significant Cost Savings on Histology

Reduces reagent costs, labor expenses, and equipment maintenance while maintaining diagnostic quality



Tissue Conservation

Preserves valuable tissue samples by reducing the need for multiple physical sections



Medical Image Analysis

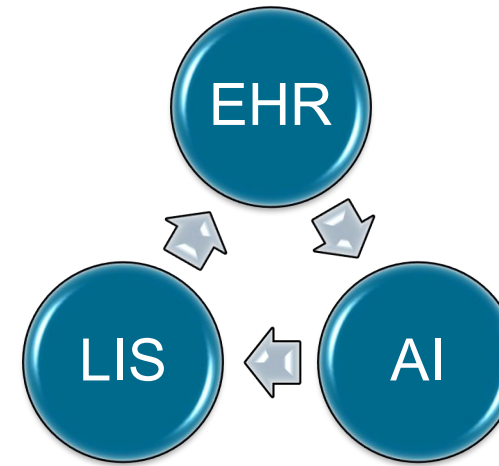
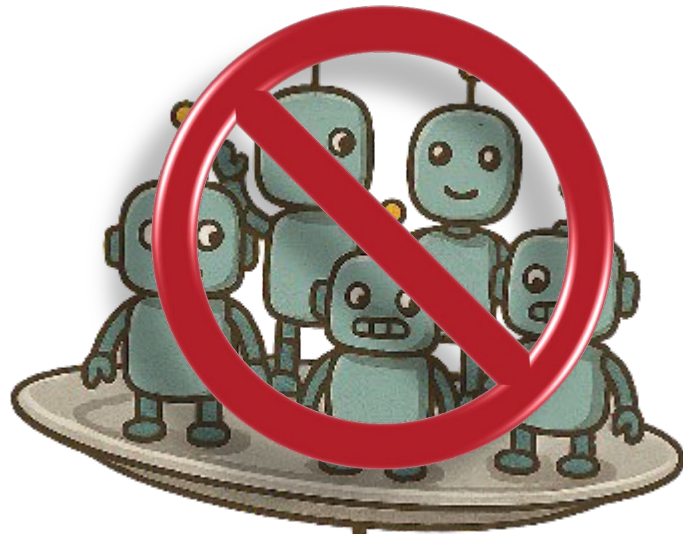
Volume 81, October 2022, 102537



Conditional GANs based system for fibrosis detection and quantification in Hematoxylin and Eosin whole slide images

Ahmed Naglah ^a, Fahmi Khalifa ^a, Ayman El-Baz ^a  , Dibson Gondim ^b

Mr. Integration is Running the Show



Data Exchange
Between Systems

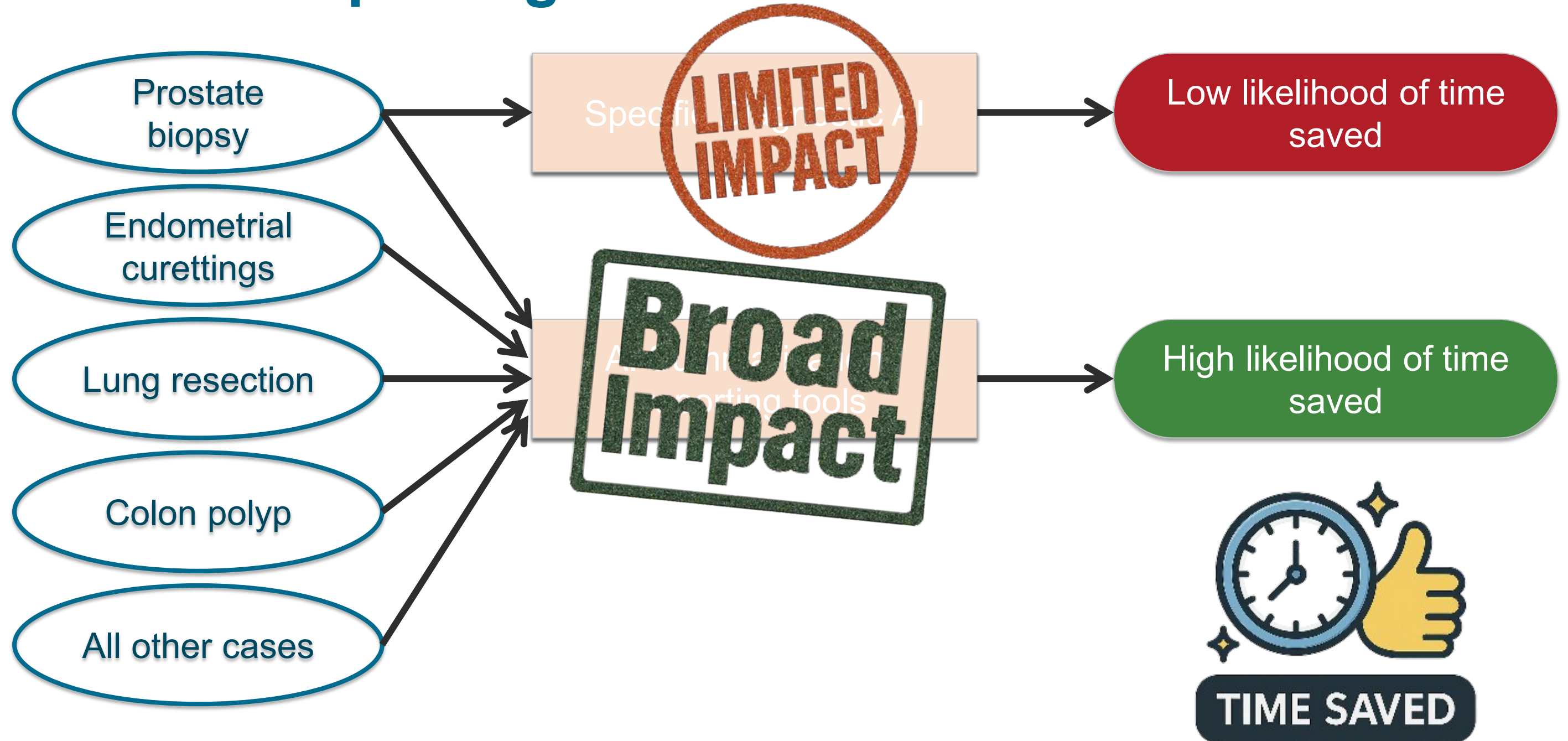


True Efficiency
Gains



NO Mr. Integration, NO show & NO time saved!

GenAI Reporting/Summarization



Diagnostic Activities

- Case review
- Diagnostic consultation
- Ancillary test results, molecular requirements
- Correlation of clinical pathology data
- Communication with clinicians

Clinical & Administrative Duties

- Tumor board
- Staff evaluation
- Quality improvement
- Directing residents
- Randomizing
- Emails
- Meetings

Education & Training

- Resident
- Resident
- Professional development
- Continuing education (CME)
- Supervision

Diagnostic AI ?

Inefficient

- Delay
- Suboptimal
- Manual

Compliance & Credentialing

- Hospital
- Board certification
- Procedure
- TB and
- Updated

Committees & Involvement

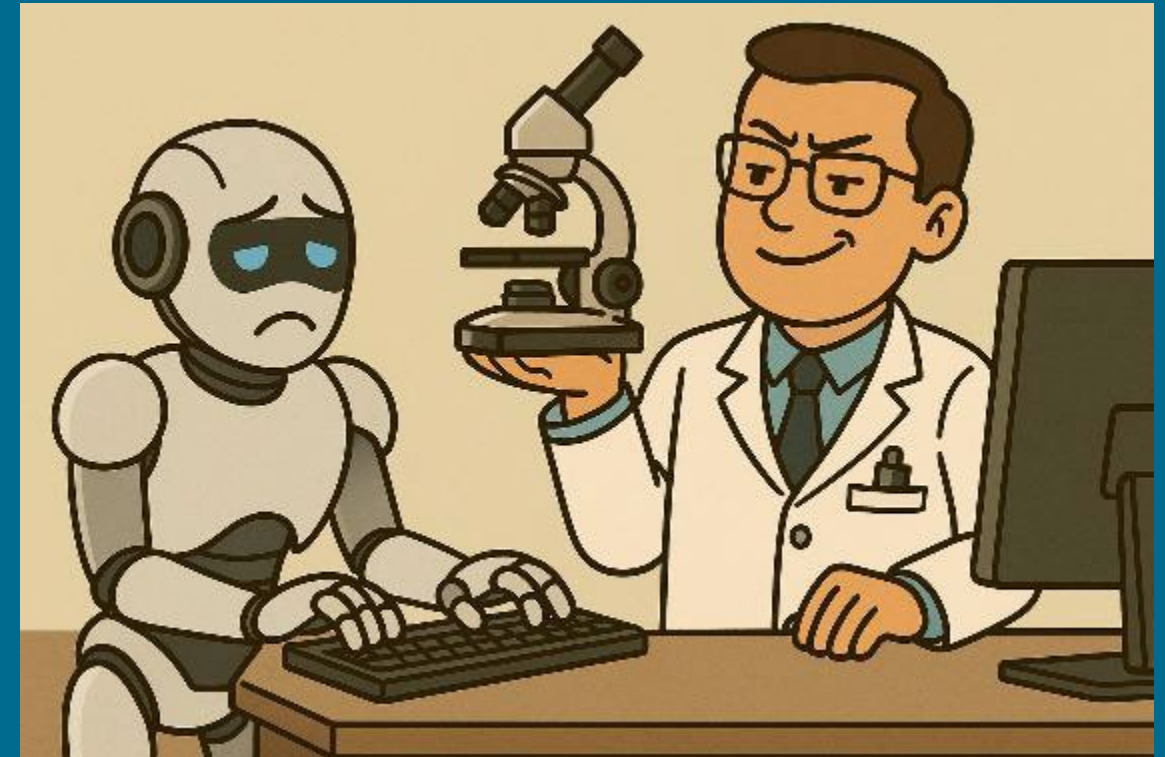
- Recruitment
- Committee
- Interview

Research & Quality Activity

- Publication
- Quality
- Leadership

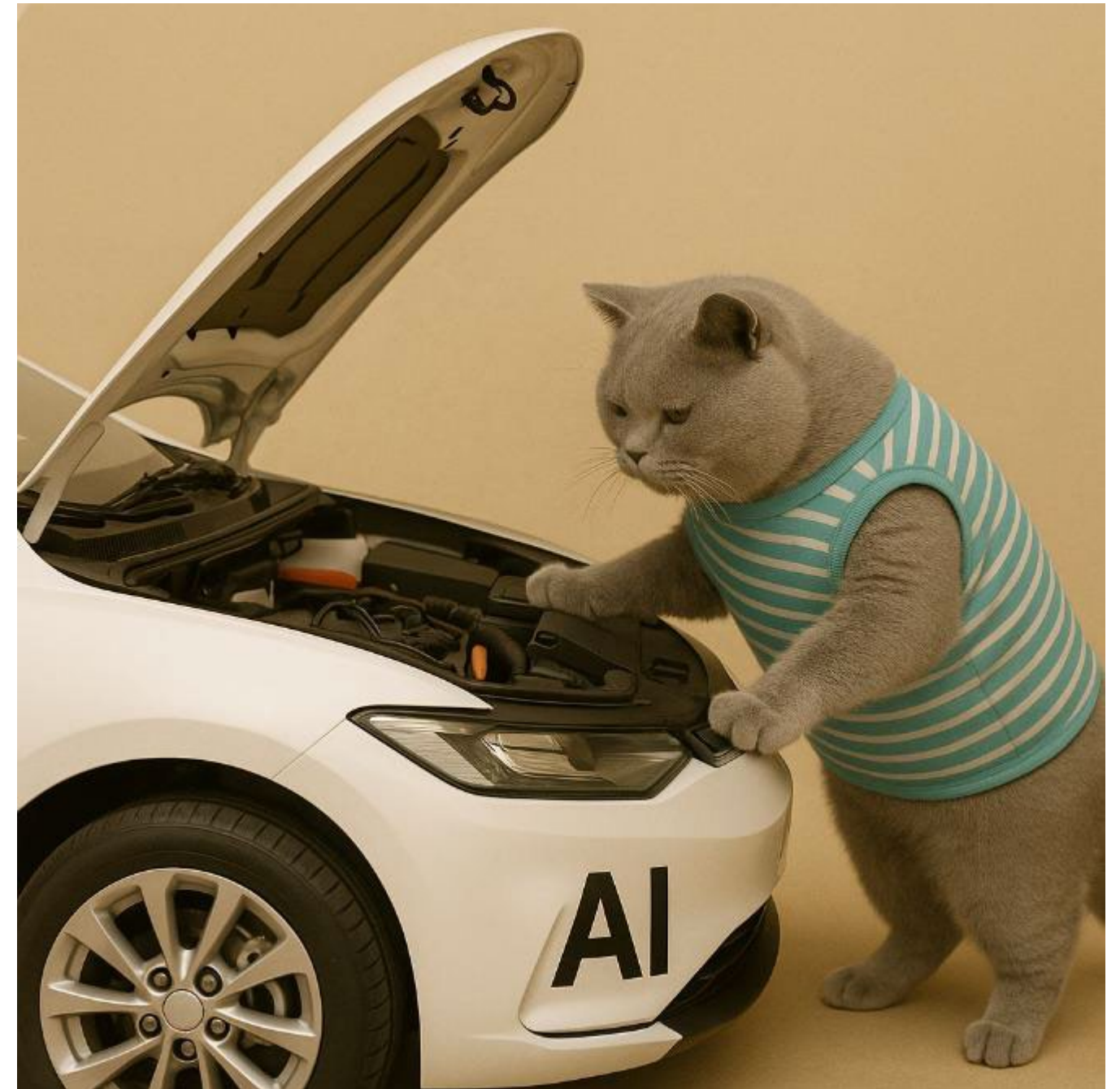
GenAI – Take Home Points

- Real impact in drafting clinical notes (peer-reviewed publications)
- More accessible technology (compared with digital pathology)
- Broader impact on pathology workflows
- Diagnostic AI is still limited in its overall impact
- A matter of time for the GenAI industry to support pathology



Looking Under the Hood

- How did we get here?
- Important considerations
- What do we think comes next?
- The evolution of AI
 - Narrow models
 - Foundational models
 - Combining data modalities for MLLMs
 - Reasoning models and you
 - Interactive models to Agentic systems

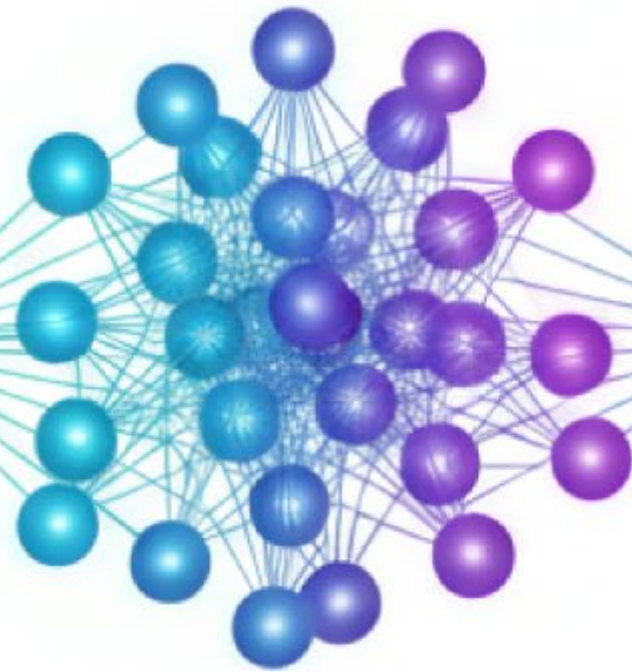


Narrow Models : FDA-cleared AI

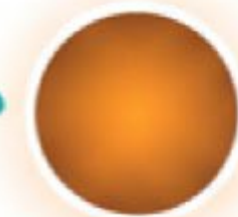
Train: Image + Label Input
Inference: Image

Model

Binary Output



Probability
Cat



Probability
Dog

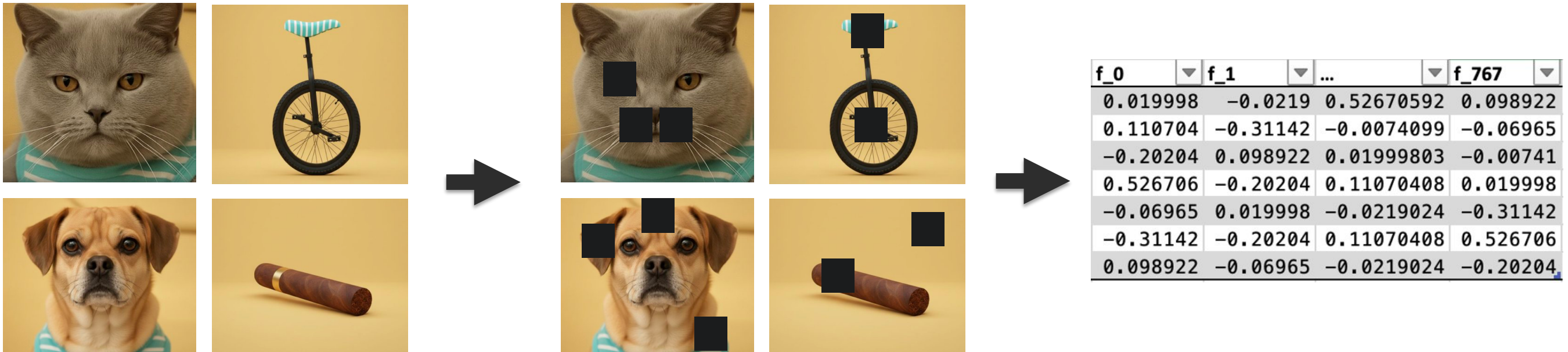
- The model learns to differentiate between options, based on classes
- Not all problems can be distilled into classes

Foundational Models

Train: Image
Inference: Image

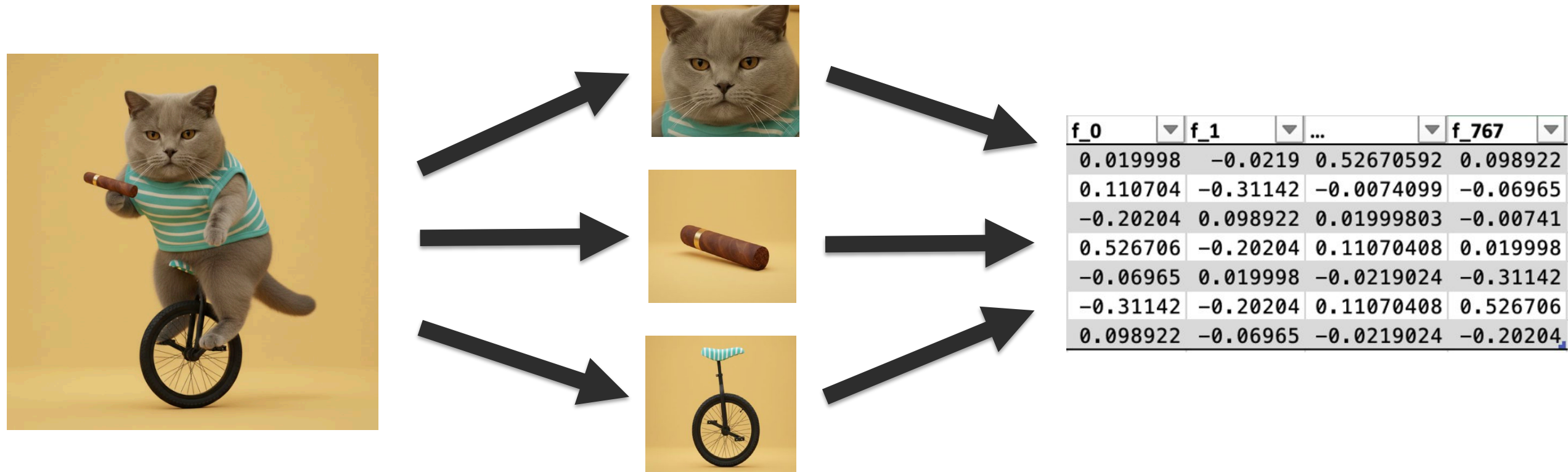
Mask Data

Numeric Output



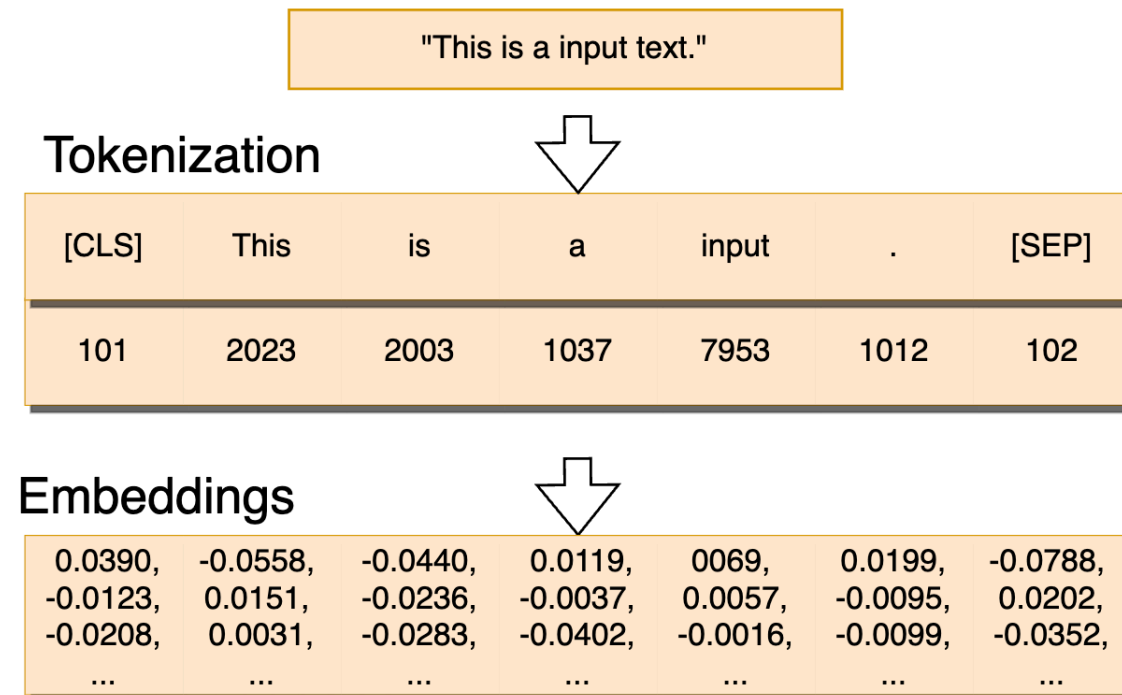
- The model learns to describe data, resulting in numerical features
- Features can be used for binary problems with class labels
- Features can also be used for much more, with or without class labels

Foundational Models



- Features can only be generated for things the model has observed
- They are not like labels and can represent combinations of classes
- Models can describe complex combinations of features that have never been observed

Multimodal LLMs (MLLM)



+



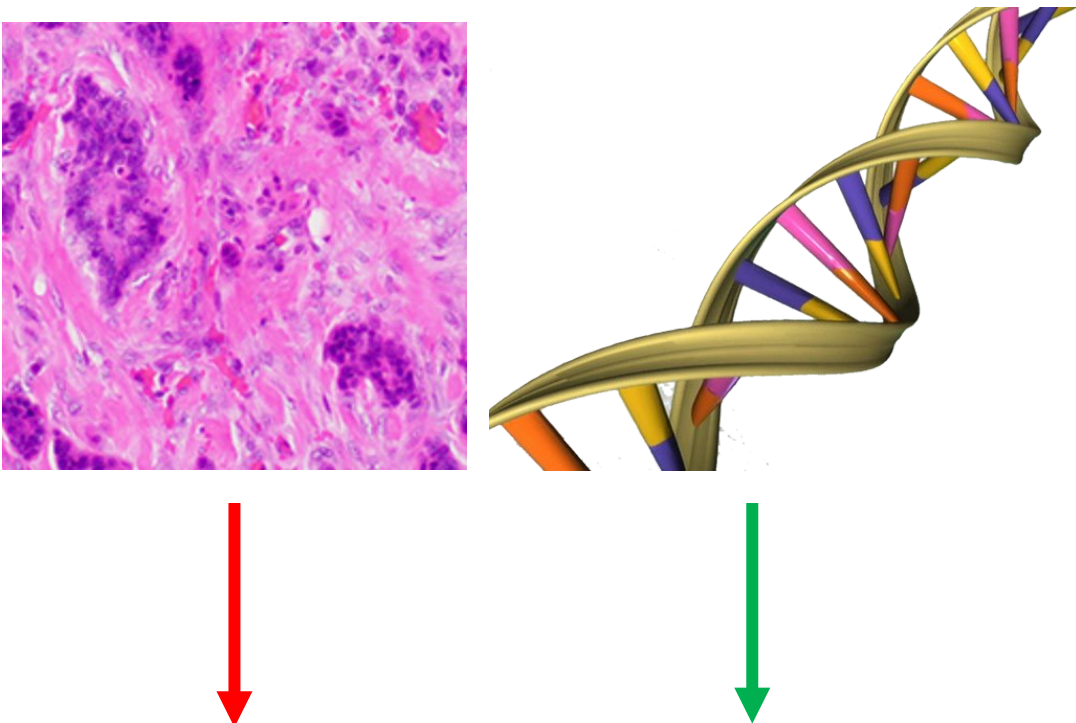
f_0	f_1	...	f_767
0.019998	-0.0219	0.52670592	0.098922
0.110704	-0.31142	-0.0074099	-0.06965
-0.20204	0.098922	0.01999803	-0.00741

- LLMs at their core work from numerical descriptions of text
- Complex descriptions of images are matched with image features
- Context (features/embeddings) are critical for generative AI performance

Multimodal LLMs (MLLM)

Inputs

- Text, imaging, timeseries (EKG, eICU), genomics, etc.
- Observe large volumes of data and provide numeric characterizations of inputs (cancer, Alzheimer, etc. features)
- Allows us to holistically leverage medical data across disciplines



age	▼	sex	▼	race	▼	alb	▼	tlc	▼	f_0	▼	f_1	▼	...	▼	f_767	▼
35		0		1		3.2		0.58		0.019998		-0.0219		0.52670592		0.098922	
66		0		1		2.9		0.72		0.110704		-0.31142		-0.0074099		-0.06965	
43		1		1		1.2		1.7		-0.20204		0.098922		0.01999803		-0.00741	
68		1		1		3.3		0.91		0.526706		-0.20204		0.11070408		0.019998	
40		1		1		1.6		1.12		-0.06965		0.019998		-0.0219024		-0.31142	
27		1		1		3.7		2.02		-0.31142		-0.20204		0.11070408		0.526706	
31		0		1		2.8		0.87		0.098922		-0.06965		-0.0219024		-0.20204	

Case Data

Image + Genomic

PathChat: AI Co-Pilot for Pathology

nature

Article | Published: 19 March 2024

Towards a general-purpose foundation model for computational pathology

[Richard J. Chen](#), [Tong Ding](#), [Ming Y. Lu](#), [Drew F. K. Williamson](#), [Guillaume Jaume](#), [Andrew H. Song](#), [Bowen Chen](#), [Andrew Zhang](#), [Daniel Shao](#), [Muhammad Shaban](#), [Mane Williams](#), [Lukas Oldenburg](#), [Luca L. Weishaupt](#), [Judy J. Wang](#), [Anurag Vaidya](#), [Long Phi Le](#), [Georg Gerber](#), [Sharifa Sahai](#), [Walt Williams](#) & [Faisal Mahmood](#) ✉

Article | Published: 19 March 2024

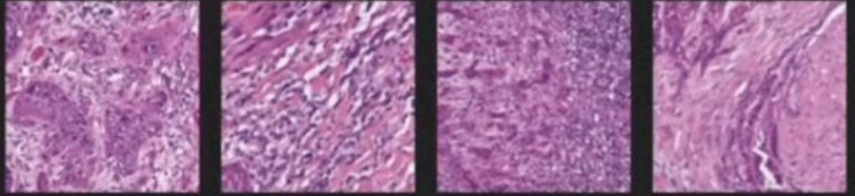
A visual-language foundation model for computational pathology

[Ming Y. Lu](#), [Bowen Chen](#), [Drew F. K. Williamson](#), [Richard J. Chen](#), [Ivy Liang](#), [Tong Ding](#), [Guillaume Jaume](#), [Igor Odintsov](#), [Long Phi Le](#), [Georg Gerber](#), [Anil V. Parwani](#), [Andrew Zhang](#) & [Faisal Mahmood](#) ✉

A multimodal generative AI copilot for human pathology

[Ming Y. Lu](#), [Bowen Chen](#), [Drew F. K. Williamson](#), [Richard J. Chen](#), [Melissa Zhao](#), [Aaron K. Chow](#), [Kenji Ikemura](#), [Ahrong Kim](#), [Dimitra Pouli](#), [Ankush Patel](#), [Amr Soliman](#), [Chengkuan Chen](#), [Tong Ding](#), [Judy J. Wang](#), [Georg Gerber](#), [Ivy Liang](#), [Long Phi Le](#), [Anil V. Parwani](#), [Luca L. Weishaupt](#) & [Faisal Mahmood](#) ✉

Summarize your microscopic findings in a pathology report for this case.



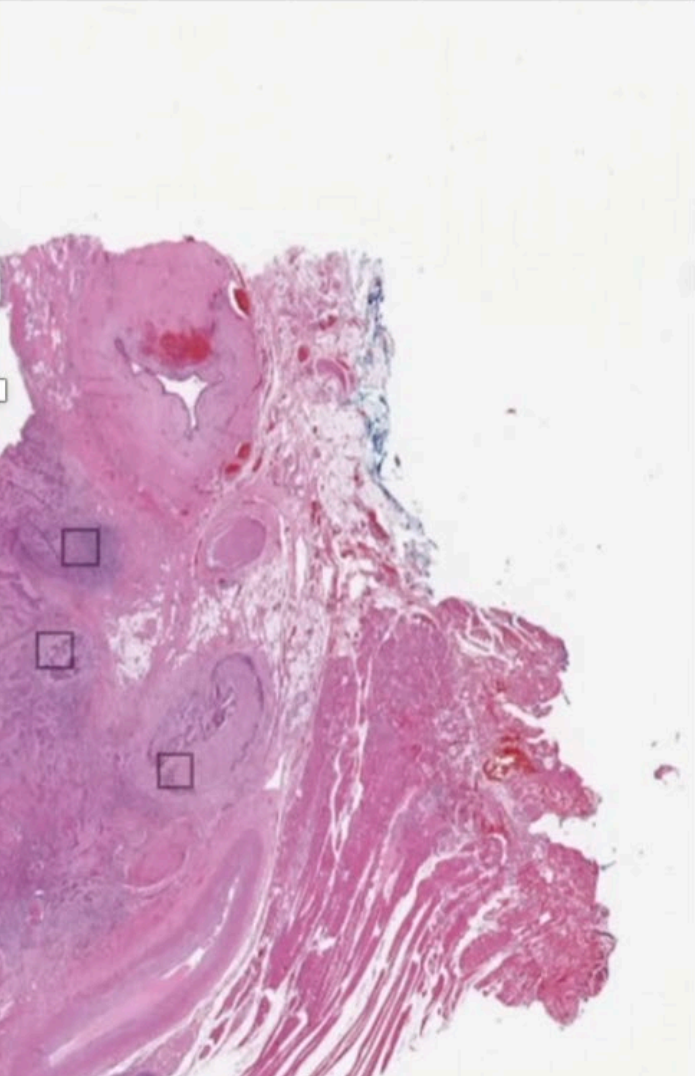
PathChat

First image: The tumor is composed of nests of squamous cells that are infiltrating the surrounding tissue. The squamous cells exhibit keratinization, a hallmark of squamous cell carcinoma.

Second image: There is a prominent lymphocytic infiltrate surrounding the tumor nests. This dense lymphocytic presence is indicative of an immune response to the tumor.

Third image: The tumor nests are surrounded by a desmoplastic stroma, which is a dense, fibrous connective tissue response to the invading tumor cells.

Fourth image: The tumor nests are infiltrating into the nerve sheath, indicating perineural



Reasoning Models

- LLMs prompts provide context to the model to generate responses
- Reasoning models allow the user to instruct the model on procedure
- While computational expensive, they open the door to complex processes that would otherwise have to be trained within the model

```
{# Enhanced Template for Generating Clear Explanations and Verifications #}  
For a PubMed research article produce a clear, step-by-step explanation of how  
If any discrepancies are identified, re-calculate and provide the correct steps  
  
Use the following text for your analysis: [{{text_data}}]
```

Restate the problem clearly using `<think>` tags.

Conclude the reasoning with the final answer inside `<answer>` tags.

Include a `<verifier_answer>` section containing only the result, formatted in va

`<think>`

Your analysis will involve providing the following the following outputs:

- Location: the location(s) where the study took place in the format county, state
- Participating origination(s): the names of the organizations involved in the s
- Data Collection Site(s): the site(s) where data was collected from participant
- Patient Recruitment Site: the location in the format of county, state, country
- Community Engagement: note any community engagement (e.g. county extension age
- Categories of Treatment: list of categories (e.g. medicine, intervention, ther
- Types of Studies: list of study types (e.g. cross-sectional study, retrospecti

Reasoning:

1. Start with the expression.
2. Explain and solve step by step
3. Conclude with the final result based on the above steps.

Recheck the steps, and answer if there is a discrepancy

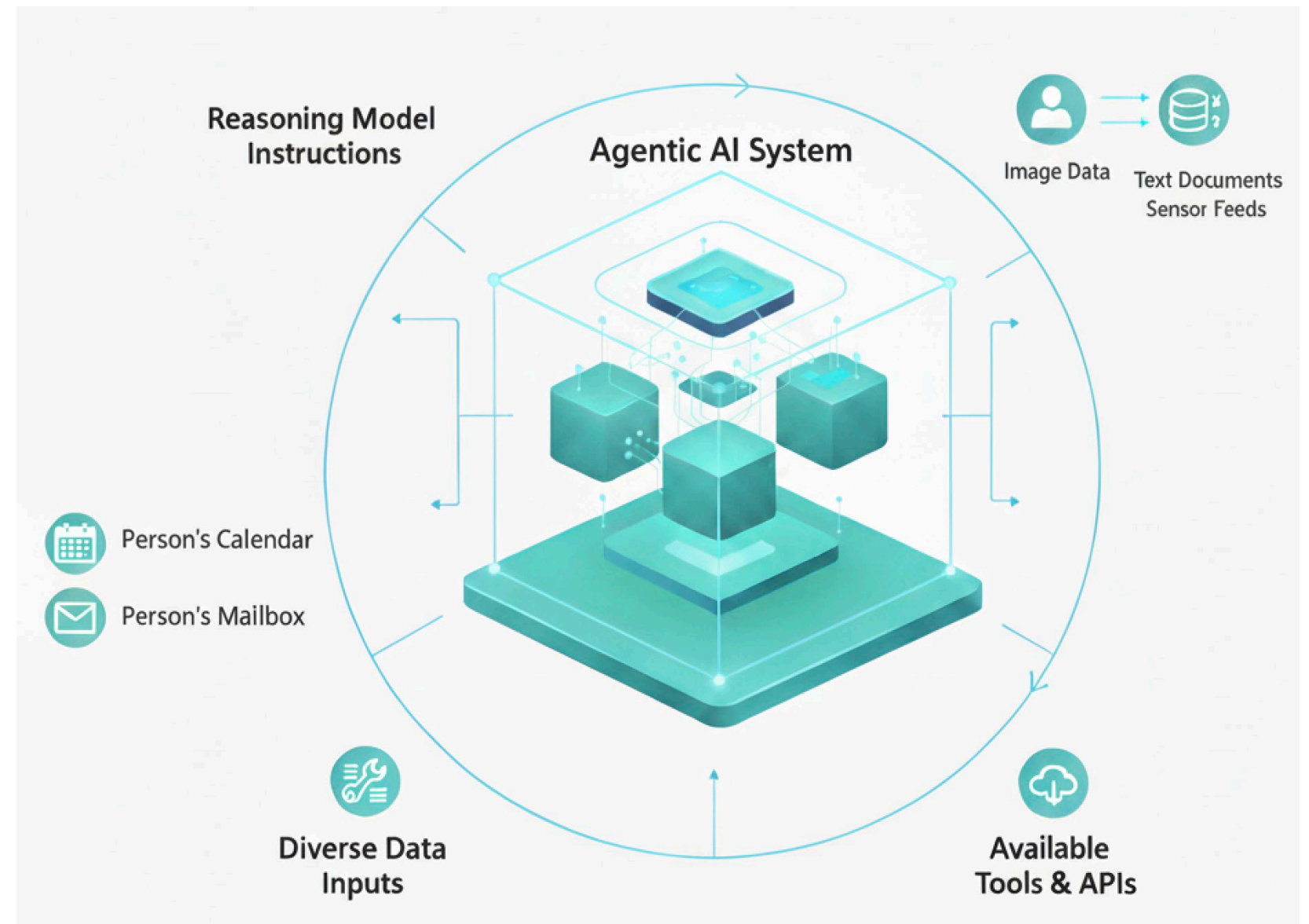
`</think>`

`<answer>`final answer`</answer>`

`<verifier_answer>`clean answer used for verification`</verifier_answer>`

Agentic AI

- Functions as your assistant
- Has access (tool calling) to external systems as you
- external systems as you
- Leverages LLM/MLLM for advanced analysis and reasoning models for procedure
- Standards are being developed for A2A



Additional Resources

- Practice Management Webpage
 - <https://www.cap.org/member-resources/practice-management>
- Previous and Upcoming Roundtables/Webinars
 - <https://www.cap.org/calendar/webinars/listing/practice-management-webinar>
- Articles Authored by Members of the CAP Practice Management Committee
 - <https://www.cap.org/member-resources/articles/category/practice-management>
- Practice Management Networking Community
 - <https://www.cap.org/member-resources/practice-management/practice-management-networking-community-application>
- Practice Management Frequently Asked Questions
 - <https://www.cap.org/member-resources/practice-management/frequently-asked-questions>

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Watch for the session evaluation form. Your feedback is important!



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