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Virtual Grand Rounds

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Participating in the Webinar

Moderator:
Vladimir Kushnir, MD, FACG

All attendees will be muted and will remain in "Listen Only Mode"

Type your questions here so that the moderator can see them.
Not all questions will be answered but we will get to as many as possible.

A handout with the slides and room to take notes can be downloaded from your control panel.

Exit

6

Virtual Grand Rounds universe.gi.org

ACG Virtual Grand Rounds

Join us for upcoming Virtual Grand Rounds!


Week 33 – Thursday, August 17, 2023
ACG Clinical Guideline: Diagnosis and Management of Gastrointestinal Subepithelial Lesions
Faculty: Brian C. Jacobson, MD, MPH, FACG
Moderator: Katrina B. Greer, MD, MS Epi
At Noon and 8pm Eastern


Week 34 – Thursday, August 24, 2023
Management of Patients With Acute Lower Gastrointestinal Bleeding: An Updated ACG Guideline
Faculty: Neil Sengupta, MD
Moderator: Lisa L. Strate, MD, MPH, FACG
At Noon and 8pm Eastern

Visit **gi.org/ACGVGR** to Register

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ACG 2023
OCTOBER 20–25, 2023 | VANCOUVER, CANADA

PRACTICE MANAGEMENT SUMMIT 2023:

ADAPTATION IS THE NEW NORM

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Virtual Grand Rounds

Disclosures

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Faculty: Sravanthi Parasa, MD

Advisory board - Fujifilms, Mahana therapeutics, Causal.ai, Allen Institute for Artificial Intelligence
Consultant: Medtronic, Thetarho.ai, UW Foster School of Business, Washington Research Foundation
Research support: Fujifilms USA, Microsoft research, Google Cloud
Co-founder: llmed.ai

OFF LABEL DISCUSSION: Open AI, Google Bard, Nuance DAX.

I will demo some of the use cases for summarization of clinical notes, generating PA letters, literature search during the talk to keep it more productive for which I might use GPT4/ huggingface tool and its plugin.

Moderator: Vladimir Kushnir, MD, FACG

Dr. Kushnir has no relevant financial relationships with ineligible companies.

**All of the relevant financial relationships listed for these individuals have been mitigated*

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Unleashing the Power of AI in Gastroenterology: Going beyond lesion detection

SRAVANTHI PARASA MD
GASTROENTEROLOGIST
SWEDISH MEDICAL CENTER
SEATTLE, USA

@sravmd
@Sravanthi Parasa

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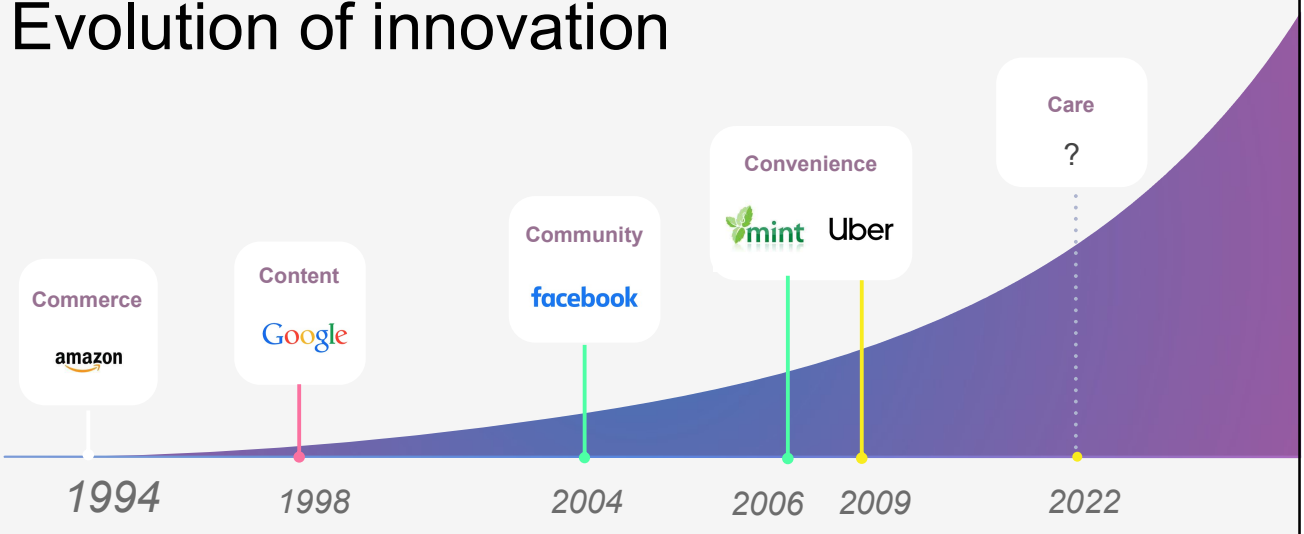
Evolution of innovation



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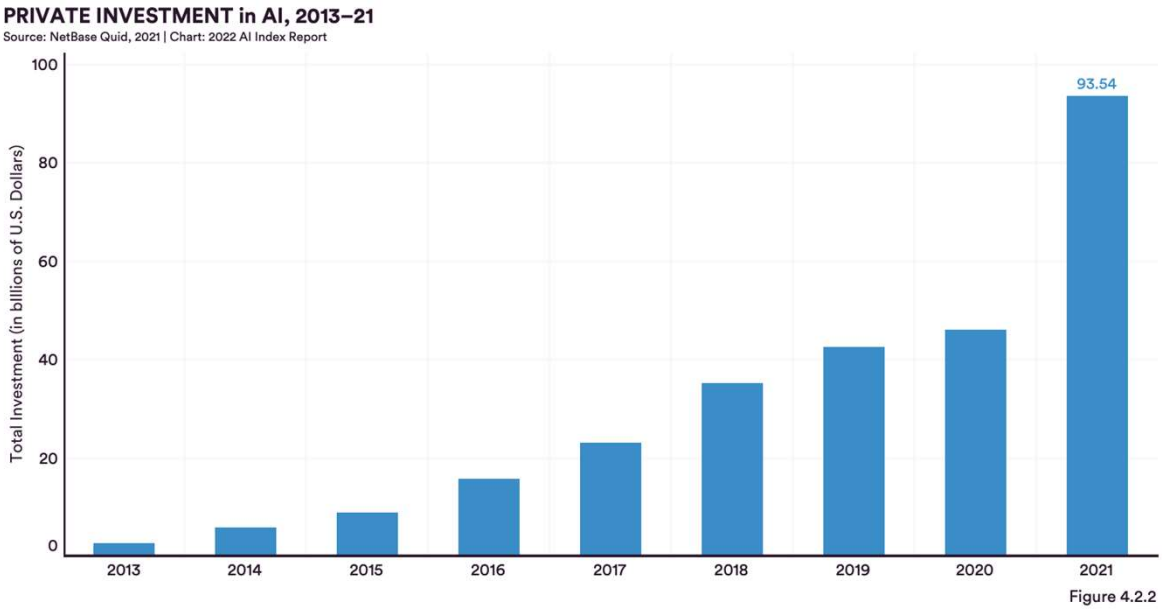
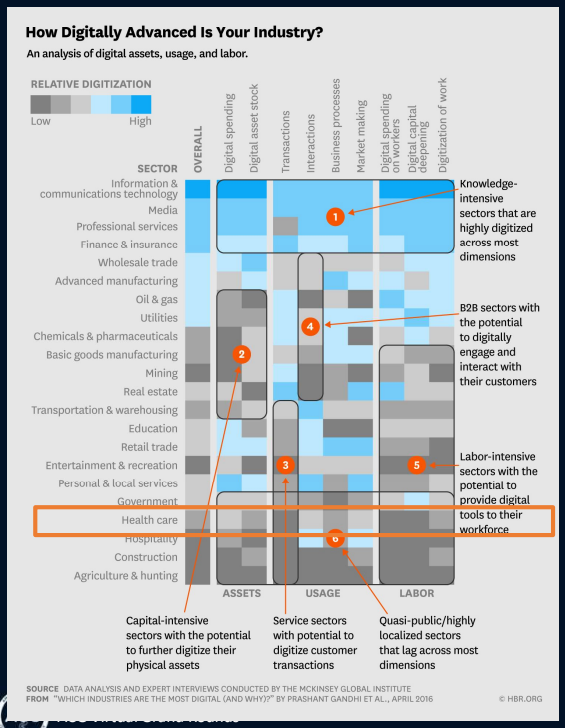
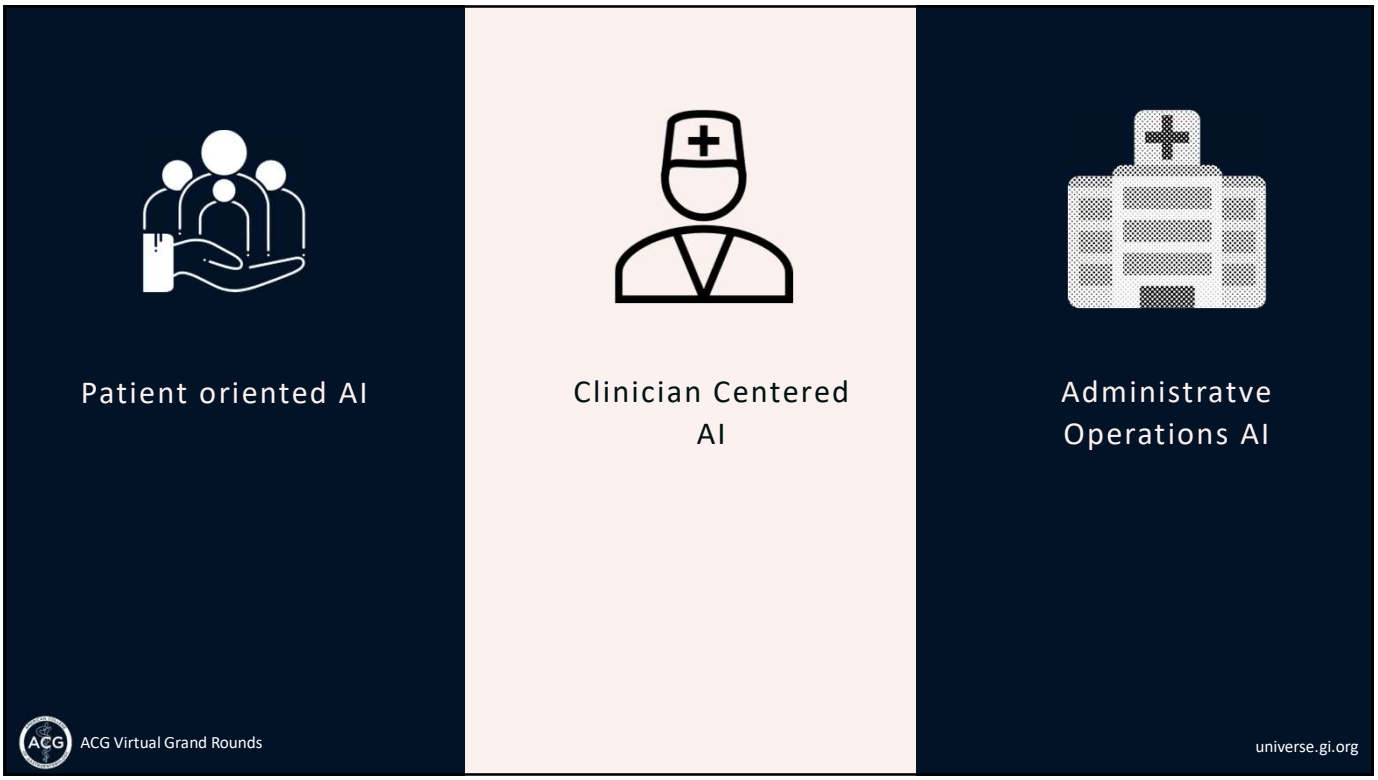




CURRENT STATE

Healthcare Industry has a significant potential to improve!


Patient oriented AI
Clinician Centered AI
Administratve Operations AI
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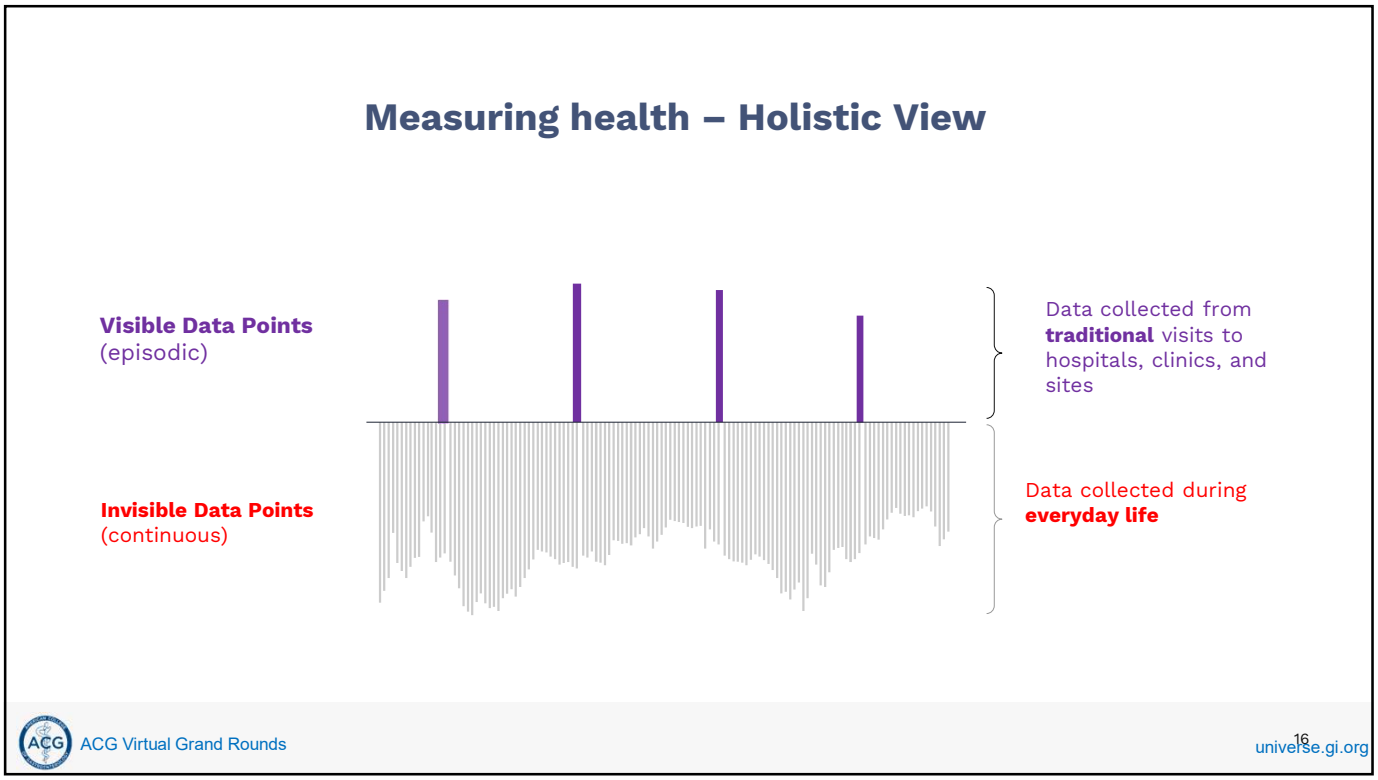
Measuring health – Holistic View
Visible Data Points
(episodic)
Invisible Data Points
(continuous)
Data collected from traditional visits to hospitals, clinics, and sites
Data collected during everyday life
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COVERED TODAY

A BRIEF OUTLINE

Creation of Technology: AI Revolution

The State of Tech

AI in GI : Use cases, Research

Q & A

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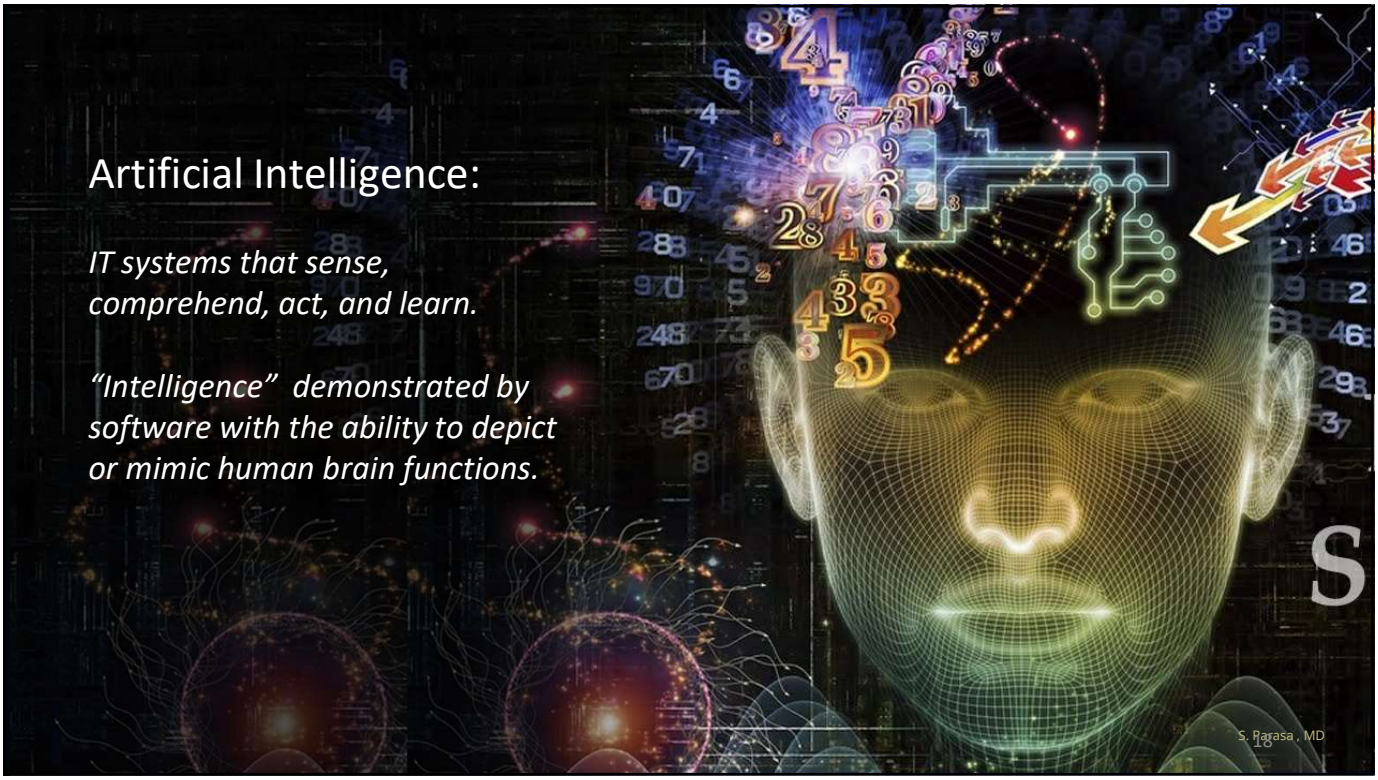
Artificial Intelligence:

IT systems that sense, comprehend, act, and learn.

"Intelligence" demonstrated by software with the ability to depict or mimic human brain functions.



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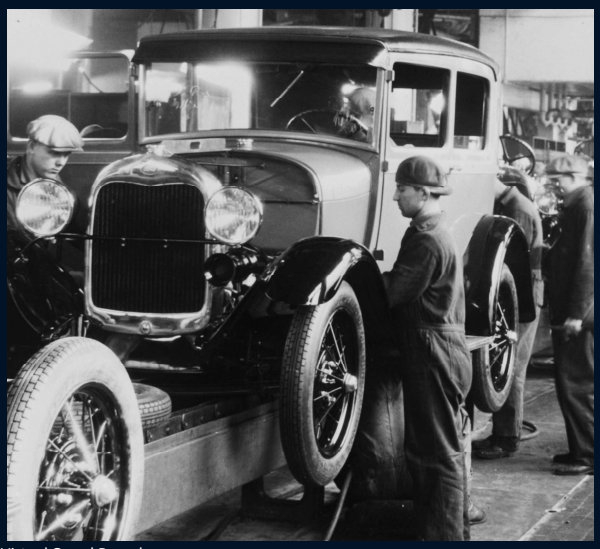
First Industrial Revolution

Automation of repetitive physical work



Intelligence Revolution:

Similar "effect" on the provision of health services today

19

AI is evolving at Warp Speed…(Which is to say *Fast!*)

Advancements in AI are different than other technologies because of the *pace & scale of innovation*, and its ***proximity to human intelligence*** – impacting us at a personal and societal level.

Vision	Speech Recognition	Reading	Translation	Speech Synthesis	Language Understanding
2016	2017	2018	2018	2018	2019
Object recognition human parity	Speech recognition human parity	Reading comprehension human parity	Machine translation human parity	Speech synthesis near-human parity	General Language Understanding human parity

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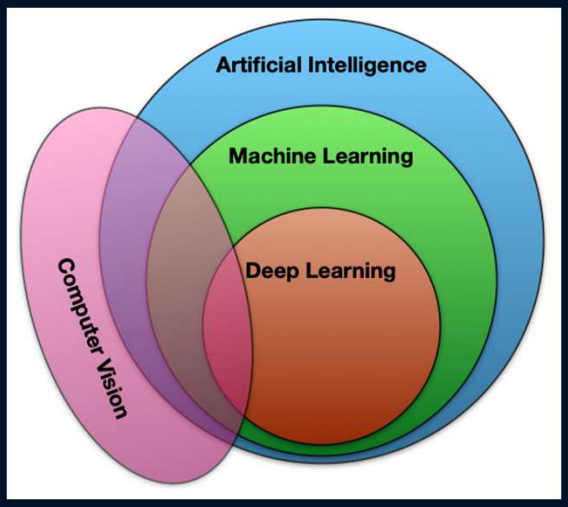
Terminology in AI



Ruffle et al Am J Gastro 2018

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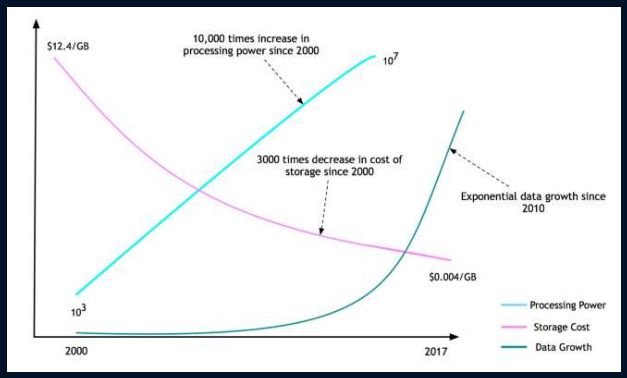
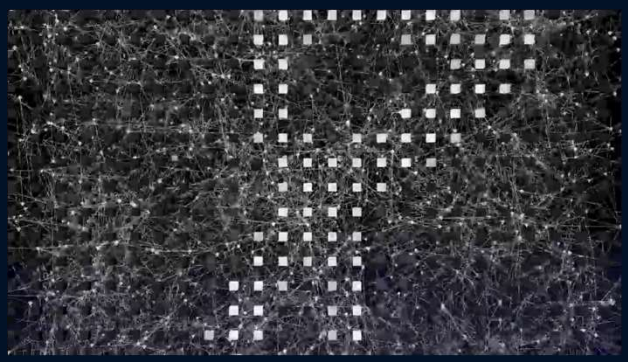
WHY NOW?





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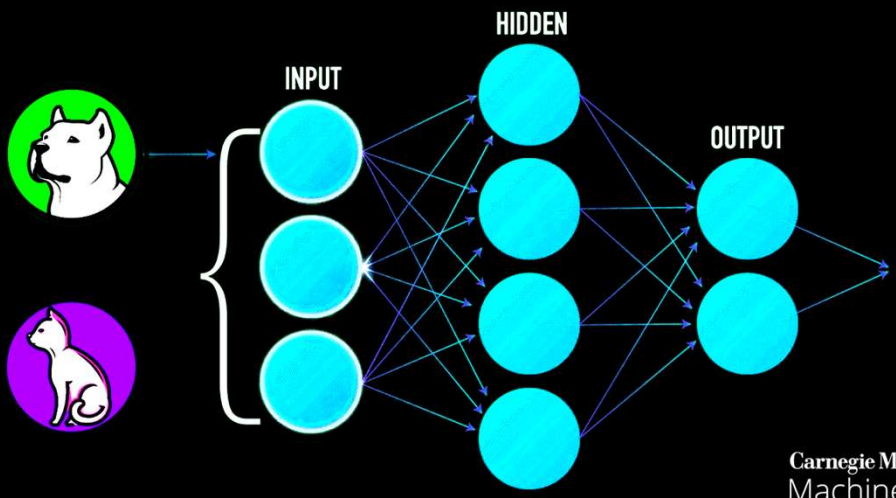
Terminology in AI



Carnegie Mellon University
Machine Learning

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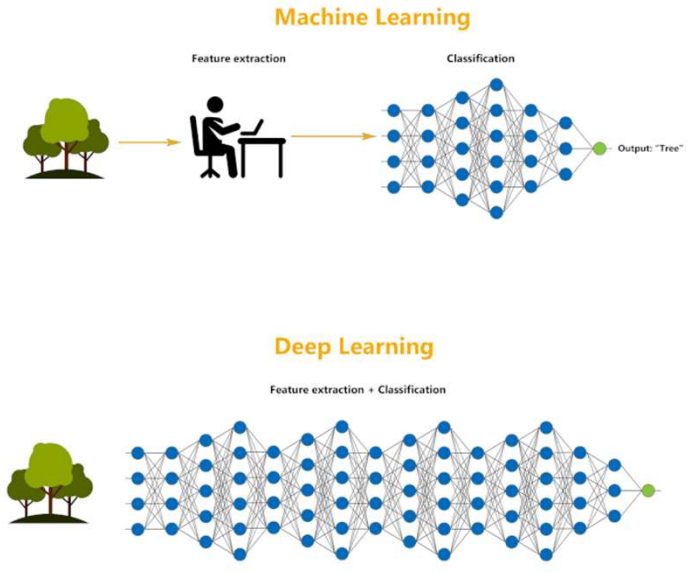
Terminology in AI



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Drug Development
Precision Medicine
Predicting LOS
Clinical Trials
No Show Predictions
Smart IOT
Sepsis
Population Health
Rx Variation
Readmissions Management
Consumer Health Management
Predicting Falls
Inpatient Deterioration
Genomics
Fraud, Waste & Abuse
Intelligent remote monitoring
Intelligent virtual care
Staffing Optimization
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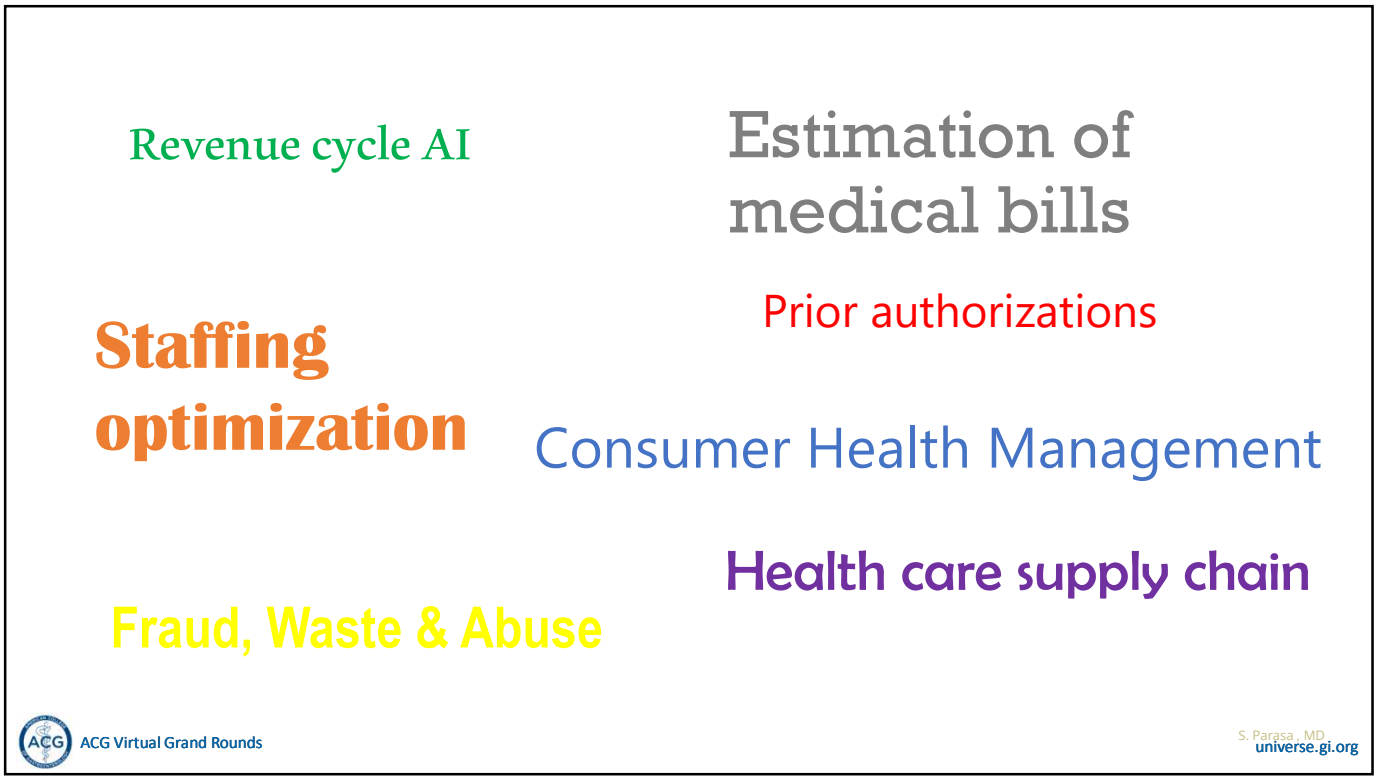
Revenue cycle AI
Estimation of medical bills
Prior authorizations
Staffing optimization
Consumer Health Management
Health care supply chain
Fraud, Waste & Abuse
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Improve endoscopy workflow?

What?

Why?

Improve endoscopy workflow using computer vision, NLP and ML to improve quality of care

How?

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What is our current endoscopy workflow? – MD view and asks

Pre- Procedure	Intra-Procedure	Post - Procedure
• Pre- Procedure instructions • Bowel preparation • Time of arrival • Transportation • Patient education	• Automate Documentation • Preview Data • Quality Metrics • Improve MD safety and fatigue	• Automate Documentation • Quality Metrics • Dashboards • Improve efficiency

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Today: Our endoscopy workflows

We can develop AI technologies to improve clinical decision-making with:

1. Clinically-informed ML techniques
2. Dataset Design
3. Human-AI Interaction
4. Conversational AI
5. NLP techniques

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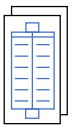
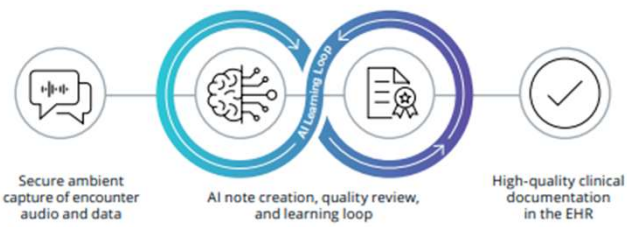
Today: Deep learning algorithms have driven successful application in gastrointestinal endoscopy and clinical documentation

Natural language processing



Text Extraction

Ambient Clinical Intelligence



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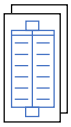
Today: Deep learning algorithms have driven successful application in gastrointestinal endoscopy and clinical documentation

Natural language processing

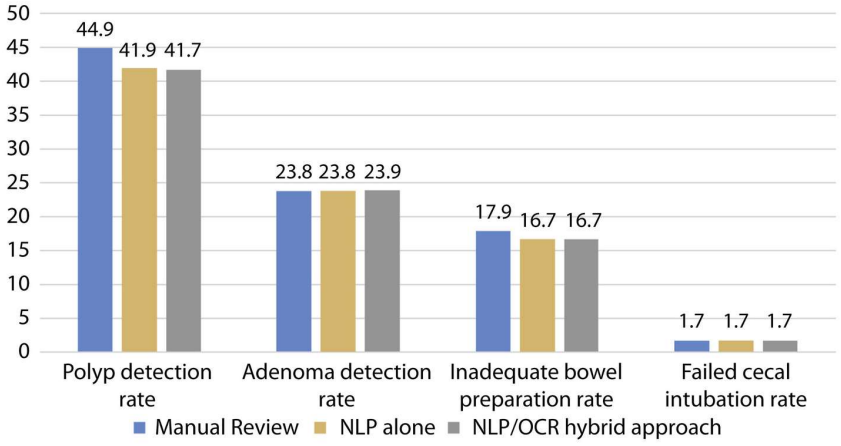


Text Extraction

What Solutions Are Coming?

- Intelligent Electronic Health Record Communication
- Automated Endoscopy Procedure Reports
- Simplifying inbasket management
- Mychart messages
- Prior Auth

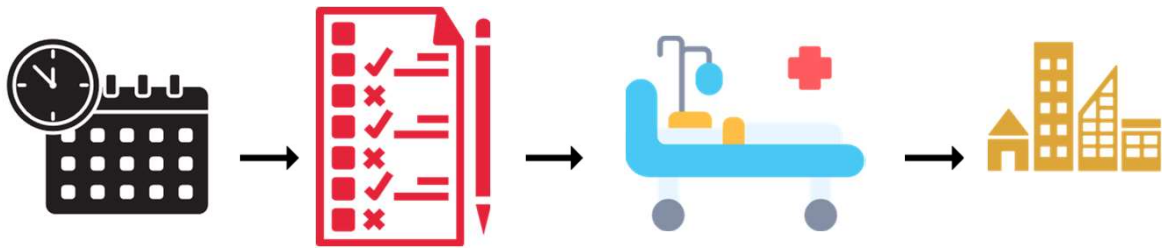
COLONOSCOPY QUALITY METRICS: OCR/NLP



Manual review	265/589 (44.9%)	140/589 (23.8%)	101/562 (17.9%)	10/589 (1.7%)
NLP	247/589 (41.9%)	140/589 (23.8%)	94/562 (16.7%)	10/589 (1.7%)
NLP/OCR	246/589 (41.7%)	141/589 (23.9%)	94/562 (16.7%)	10/589 (1.7%)

Wei Zhou, Liwen Yao, Huiling Wu, Biqing Zheng, Shan Hu, Lihui Zhang, Xun Li, Chunping He, Zhengqiang Wang, Yanxia Li, Chao Huang, Mingwen Guo, Xiaoqing Zhang, Qingxi Zhu, Lianlian Wu, Yunchao Deng, Jun Zhang, Wei Tan, Chao Li, Chenxia Zhang, Rongrong Gong, Hongliu Du, Jie Zhou, Prateek Sharma, Honggang Yu, Multi-step validation of a deep learning-based system for the quantification of bowel preparation: a prospective, observational study, The Lancet Digital Health, 2021

Endoscopy workflow – Patient view



Scheduling

Procedure preparation

Preprocedure and Procedure

Post procedure
-Understanding
Documentation
-Patient outcomes

33

Endoscopy – Patient workflow optimization

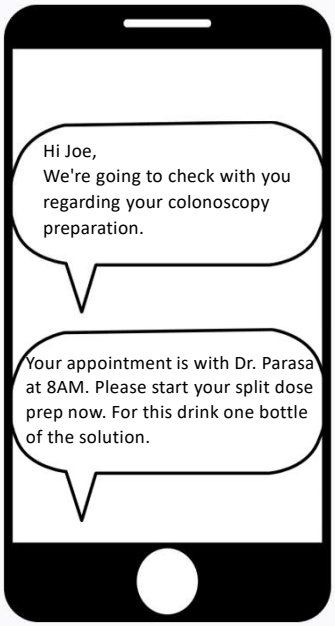
Integration with consumer devices

Endoscopy scheduling: time-based protocols associated with a procedure type and date

Patient reported outcomes- automatic survey questions

Patient Education

34



HIPAA - Compliant Patient Communication

A series of messages to support patient readiness:

- Reminders to stop taking blood thinners
- ensures acquisition of bowel prep supplies
- guides patients through successful execution of the bowel prep process
- Instructions regarding transport and directions

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Revenue cycle AI

Estimation of medical bills

Prior authorizations

Staffing optimization

Consumer Health Management

Health care supply chain

Fraud, Waste & Abuse

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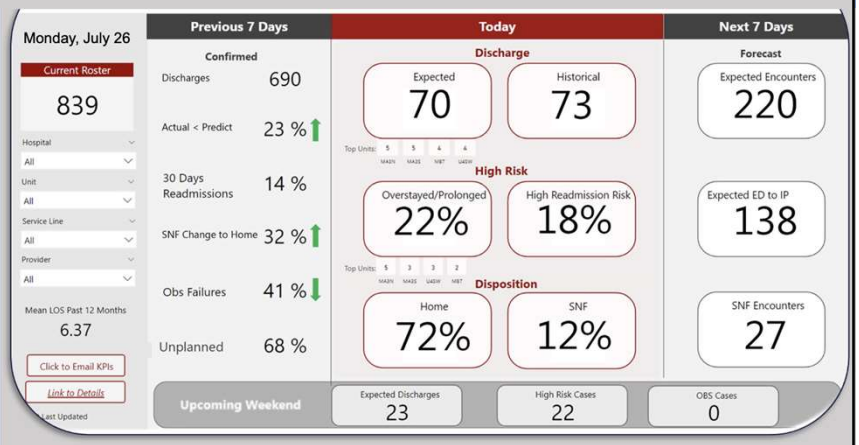
Improving workflow

Patient Flow Solution

- Unit View
  - Apply calculations to determine staff needed based on predictions
- Capacity Alerting
  - What units are at risk of under/over staffing

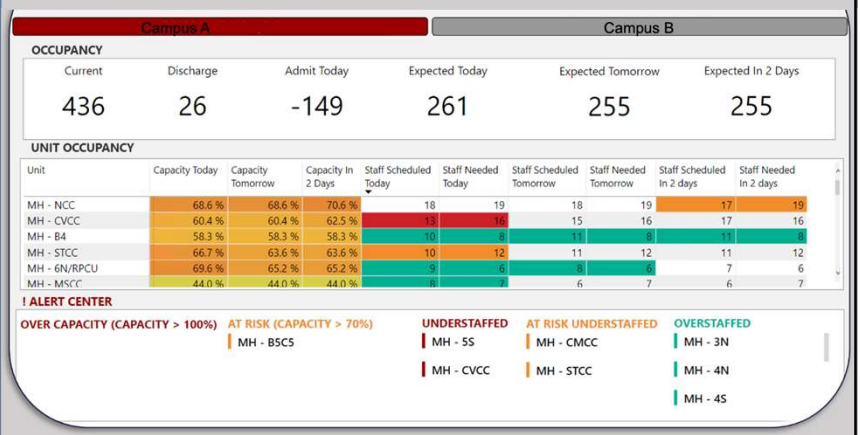


Improving workflow

Staffing Predictions

Staffing Office Resource

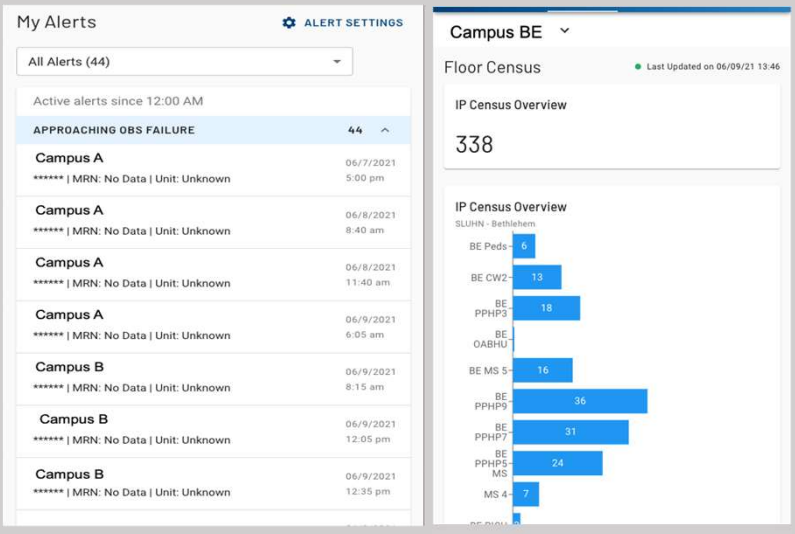
- Unit View
  - Apply calculations to determine staff needed based on predictions
- Capacity Alerting
  - What units are at risk of under/over staffing



Technologies

- ✓ Mobile App
  - Care Event Alerts
  - Real-time Advanced Analytics
- ✓ Dashboards
  - Real-time
  - Retrospective
  - Forecasting
- ✓ AI Platform for Digital Health
  - Enterprise Analytics Portal
  - Access to real-time and batched data

Improving workflow



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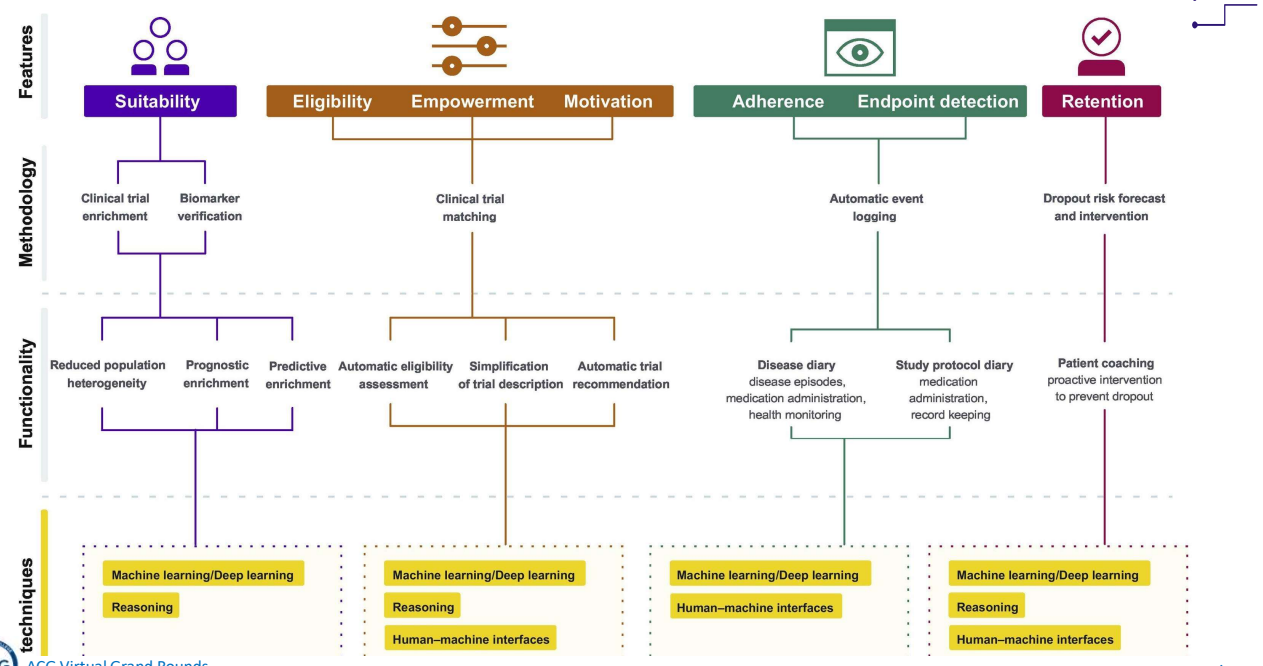
AI for CLINICAL TRIAL DESIGN: METHODOLOGY



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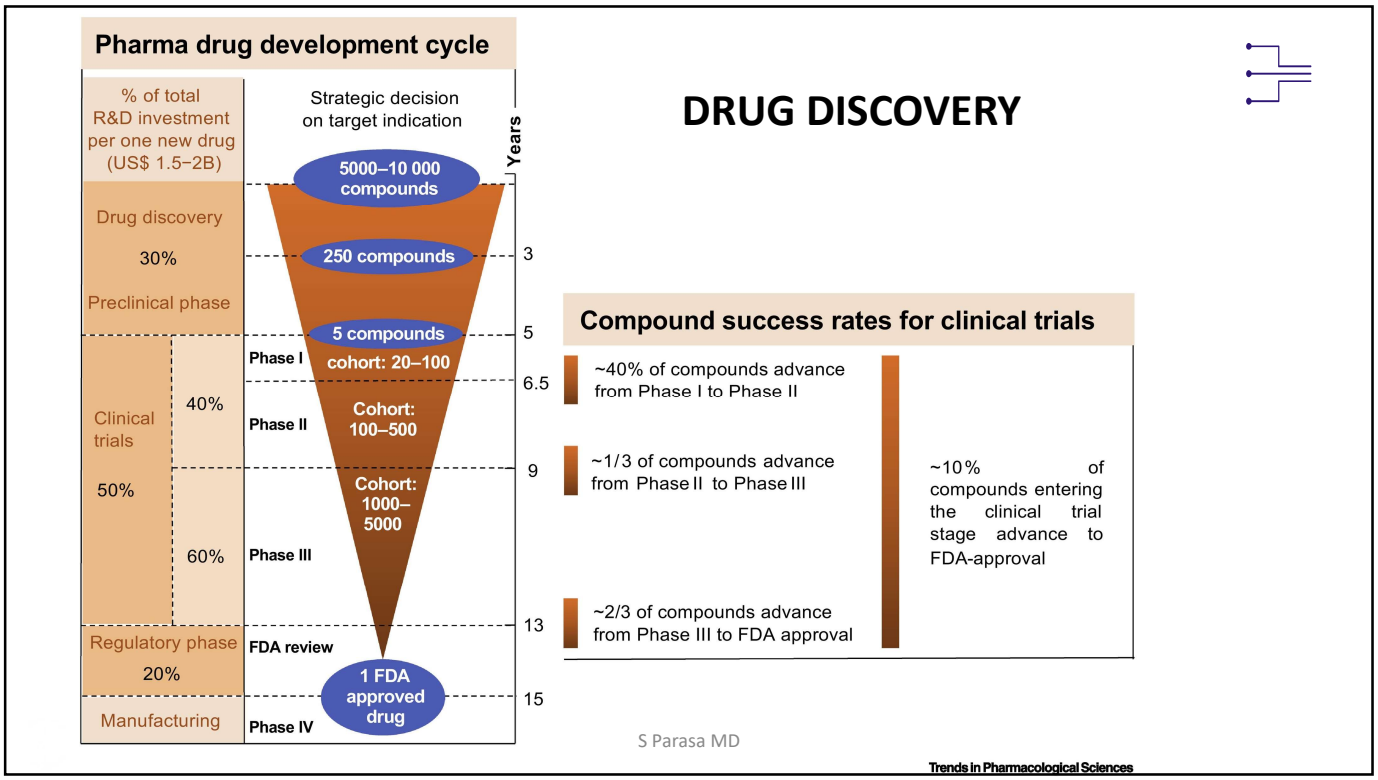

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IMPROVING CLINICAL TRIALS:
AI tackles key pain points, unlocking cost savings and revenue opportunities while improving prognosis: Central Reading

Pain points	Solution	Expected benefits
Central reading is costly and very time consuming	An **integrated tool** offering frame **detection** and **scoring decision support** to Central Readers and physicians	Reduced central reading and clinical trial times
Isolating frames of interest is a long and often manual task		More precise and granular scoring, driving deeper insights
Scoring is subject to subjectivity and bias		Cheaper AI-enabled reads driving savings and efficiencies

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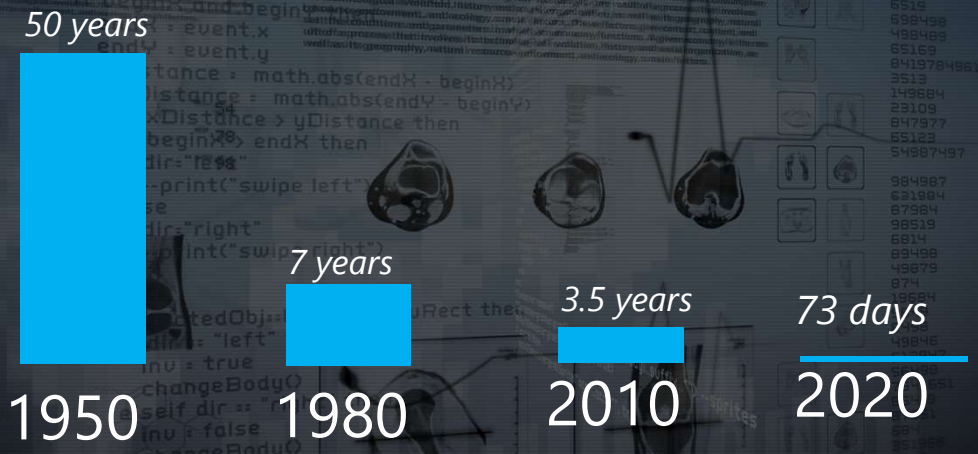
Doubling Time of Medical Knowledge by Year



Densen, Peter MD, "Challenges and Opportunities Facing Medical Education." Trans Am Clin Climatol Assoc. 2011: 122: 48-58

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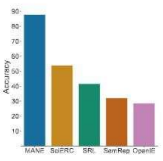
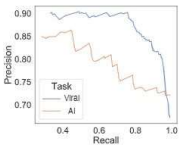
AI USE CASES

MEDICAL LITERATURE

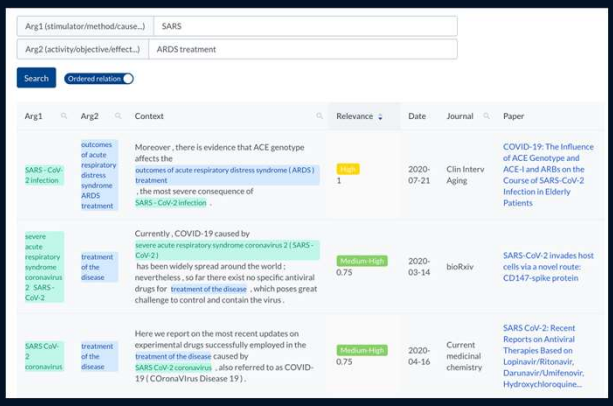
Extracting a Knowledge Base of Mechanisms from COVID-19 Papers





Metric	PubMed	Mech KB
Search	71%	90%
Utility	69.5%	92%
Interface	78%	90%
Overall	74%	91%

Figure 4: Evaluating COMB in studies with experts. COMB is found to have high quality and utility, outperforming other approaches. **Left:** Using external resources with either *specific* types of mechanisms or *open* relations, in human evaluation for correctness and usefulness of predictions, on a sample of 300 predicted relations. We reach high accuracy (88%) in absolute terms. **Center:** Retrieved relations are ranked by relevance and compared to gold labels to compute precision/recall for the viral mechanisms and AI applications tasks. **Right:** Results of COMB search study with five practicing MDs, using both our system and PubMed to search the literature. The experts were given a post-study questionnaire with 21 questions, grouped by subject (search, utility, interface).



IN COLLABORATION WITH AI2 : paper accepted to NAACL 2021

https://covidmechanisms.apps.allenai.org/

BUILDING BIOMEDICAL KNOWLEDGE GRAPHS

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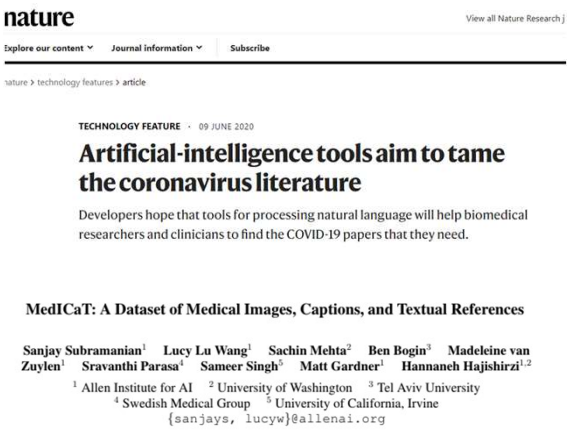
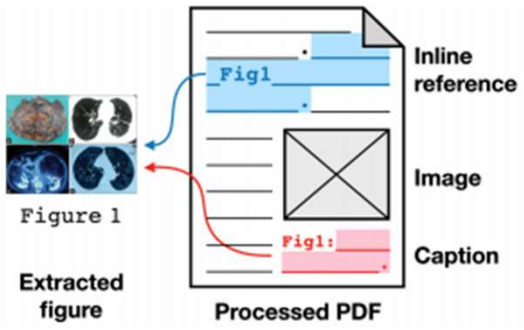
AI USE CASES

MEDICAL LITERATURE





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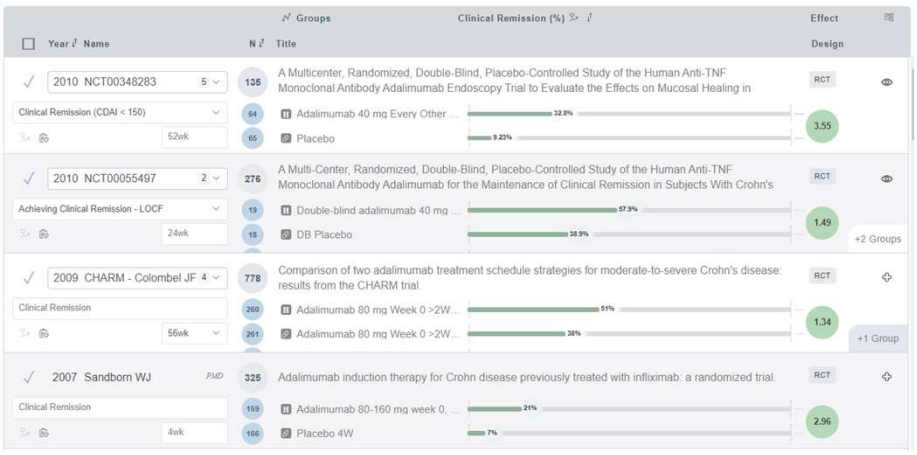
https://www.nature.com/articles/d41586-020-01733-7
MedICaT: A Dataset of Medical Images, Captions, and Textual References
Sanjay Subramanian, Lucy Lu Wang, Sachin Mehta, Ben Bogin, Madeleine van Zuylen, Sravanthi Parasa, Sameer Singh, Matt Gardner, Hannaneh Hajishirzi Findings of EMNLP • 2020

MEDICAL LITERATURE
EXAMPLE OF APPLICATIONS

- Improved search
- AI infused search to get meaningful insights
- Quantification of results

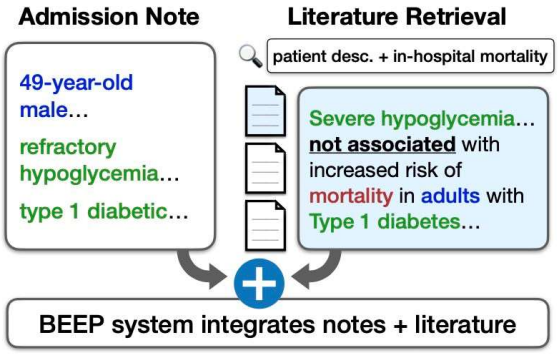


https://drevidence.com/doc-analytics/

MEDICAL LITERATURE

Boosting Clinical Outcome Prediction Using Biomedical Literature

Aakanksha Naik [1*] Sravanthi Parasa[2] Sergey Feldman[3] Lucy Lu Wang[3] Tom Hope[3,4]
[1]Language Technologies Institute, Carnegie Mellon University
[2]Swedish Medical Group [3]Allen Institute for Artificial Intelligence
[4] Paul G. Allen School for Computer Science & Engineering, University of Washington
anaik@andrew.cmu.edu {tomh,lucyw,sergey}@allenai.org



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Paradigm Shift

From…

Ok, I have a machine learning **model**…now what?

To…

Ok, I have this **problem** I need to solve…how could machine learning enable the solution?

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BE INSPIRED

“

Imagination is more important than knowledge.

ALBERT EINSTEIN

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QUESTIONS?

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Virtual Grand Rounds

Questions

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Faculty: Sravanthi Parasa, MD

Moderator: Vladimir Kushnir, MD, FACG

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