



imagia

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Founder & COO

# Imaging Precision Medicine Beyond Deep Learning Models

AI-Driven Accessible Personalized Cancer Care

# Difficulty of Data

## STAKEHOLDER PERSPECTIVES



### ADMINISTRATOR

**Data stewardship** of specimens, studies & reports collected through clinical activities, retained for compliance purposes.

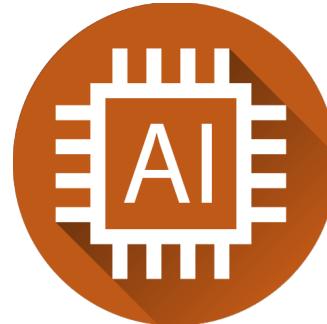
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### CLINICAL RESEARCHER

**Data insights** into patient condition and disease progression arise from volume, velocity, variety and veracity.

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### AI SCIENTIST

**Data quality** is goodness of representation & generalization of learnt patterns over future data.

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### REGULATOR

**Data Privacy** ensures patients have control over uses, and revoking such at any point in time.

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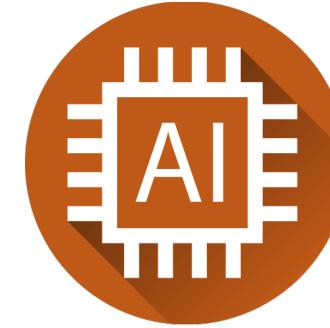
# Healthcare AI Stakeholders

## EXPECTATIONS



### Clinical Researcher

To Assemble Cohorts  
Without Manual Curation



### AI Scientist

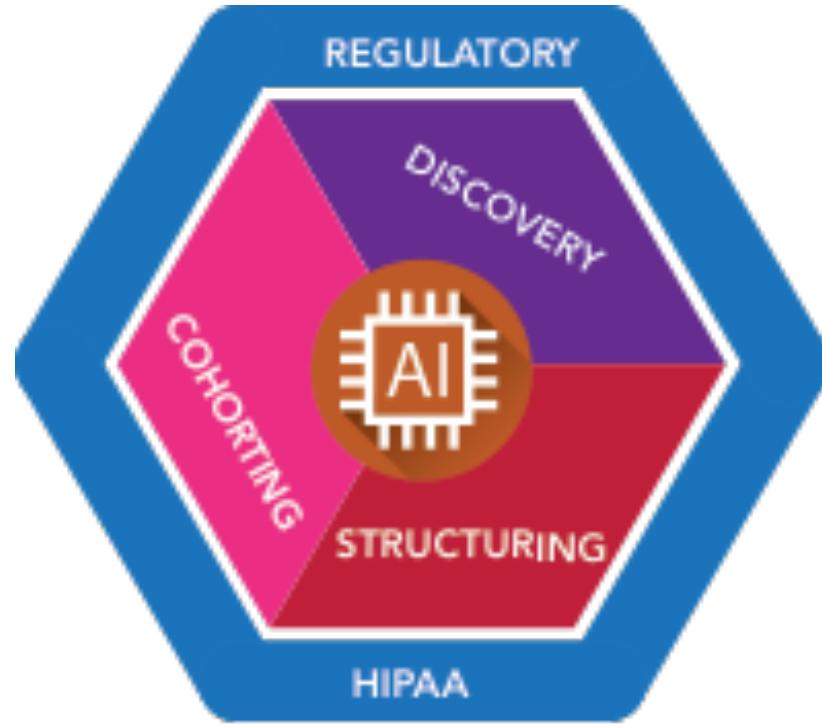
AI Ready Big Data Sets for Discovery  
Without Regulatory Constraints

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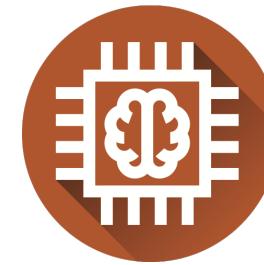
END-TO-END DATA COHERENCY FOR CLINICAL BREAKTHROUGHS

# Imagia Ecosystem

EVIDENS



Scaling up an AI-driven collaborative distributed discovery ecosystem



Data access &  
analysis across  
institutions



Making  
healthcare  
data AI-ready

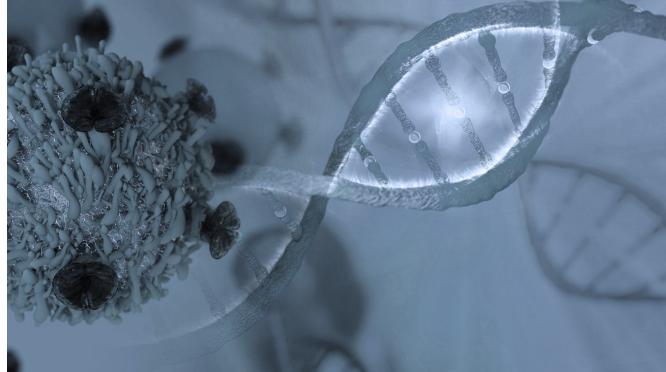


Ensure patient  
privacy &  
traceability rights

ACCELERATING DISCOVERY OF NEW INSIGHTS FOR PERSONALIZED CARE

# AI-First Collaborations

ACCELERATING ACCESSIBLE PERSONALIZED CANCER CARE



## BIOTECH / PHARMA

IMAGING BIOMARKERS FOR

- PROGRESSION PREDICTION
- RESPONSE PREDICTION



## INTERVENTIONAL / DIAGNOSTIC OEM

BESPOKE IMAGE-GUIDED AI FOR  
CLINICAL DECISION SUPPORT

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CONTRIBUTE DATA - UNITE EXPERTISE

# Clinical Decision Support

## Colon Cancer Endoscopy



### Polyp Malignancy Determination

Imagia

>90% in real time

GI Key Opinion Leaders

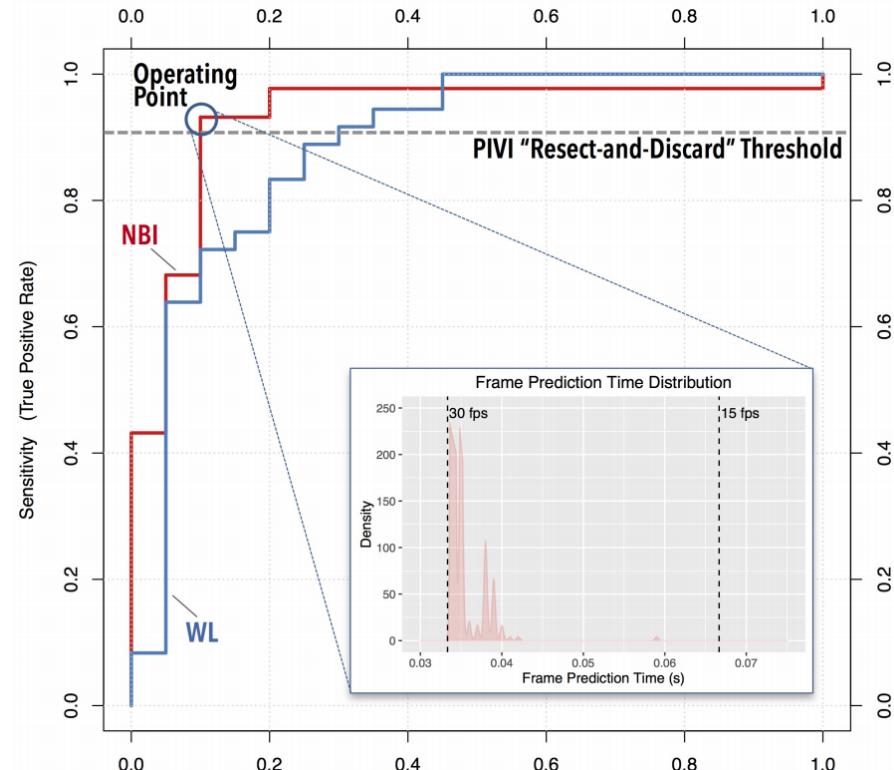
~90%

GIs Trained by KOLs

~75%

Commercial discussions with Colonoscopy OEMs

# Clinical Benefits



## Evidence-Based Society Guidelines

PIVI Statement		
	PRESERVATION AND INCORPORATION OF VALUABLE ENDOSCOPIC INNOVATIONS	
1	<b>Resect &amp; Discard</b> ≤5mm polyps	<b>High Confidence</b> Optical Diagnosis has ≥ 90% agreement in assignment of post-polypectomy surveillance intervals, using pathology standard
2	<b>Do Not Resect</b> rectosigmoid hyperplastic ≤5mm	<b>High Confidence</b> Optical Diagnosis has ≥ 90% Negative Predictive Value (NPV) for adenoma

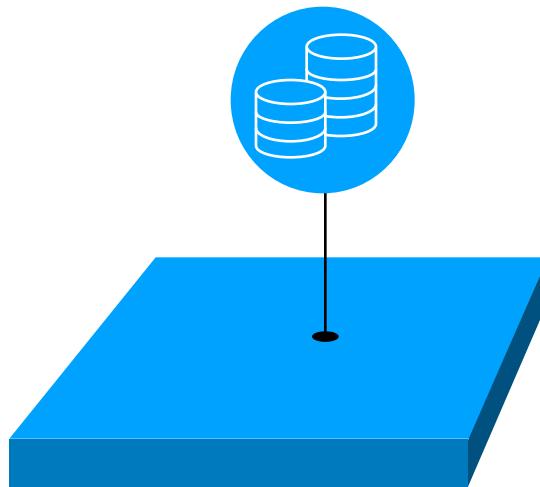
\*Apply in high confidence predictions

\*\* Must permanently store polyp images for quality review

Rex et al. Gastrointest Endosc 2011

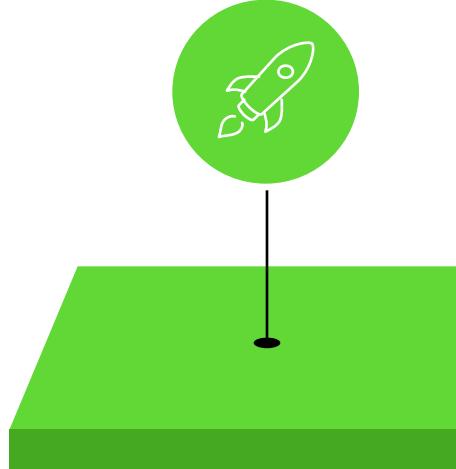
## AI meets PIVI Guidelines

# Beyond the model



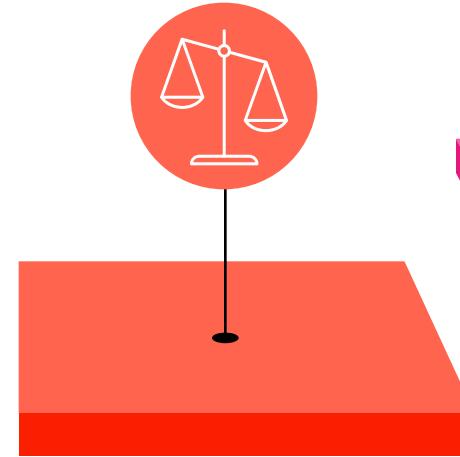
Semi-Automating Data Curation

- Class vs Ground truth
- Right Data (Blurred frames, Bubbles, Instruments)



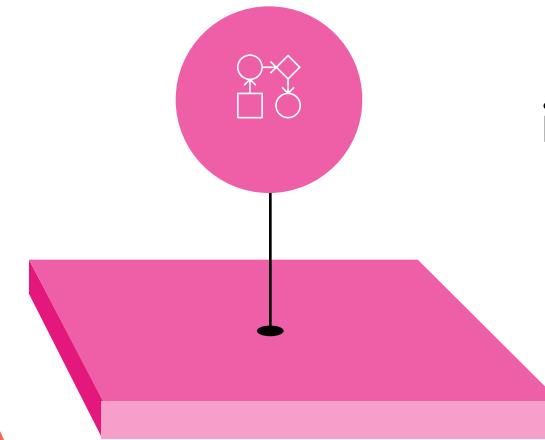
Data Augmentation

- Increasing robustness



Unbalanced data set

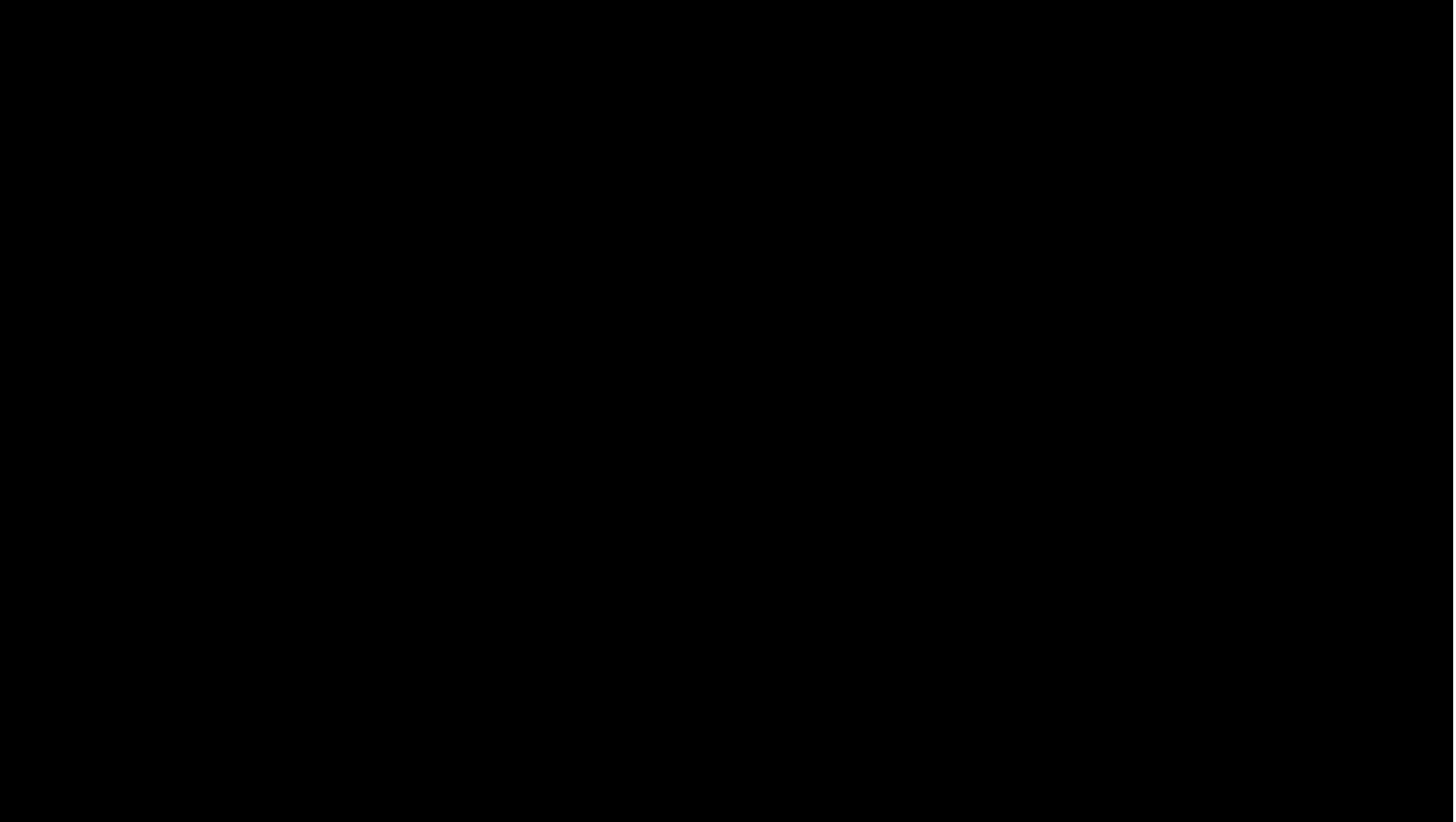
- Homogeneous subgroups  
Type 1 / Type 2  
No Polyp / Unsuitable
- Mutually exclusive



Baseline models tests

- Stop training when loss increase on a validation set
- Visual validation

Are you training on the right data?



# Research partner: MILA – Imagia Agreement



Co-father of Deep Learning



Professor Yoshua **Bengio**  
**Imagia** Scientific Advisor

Industrial Post-Doc at Imagia for Oncology  
50% time at Mila / 50% time at Imagia

**Bengio** Alumnus



Nicolas **Chapados**  
**Imagia** CSO

Shared long-term research roadmap & resources

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**Joint commitment to advance AI for Healthcare**



AI-Driven Accessible  
Personalized Cancer Care



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