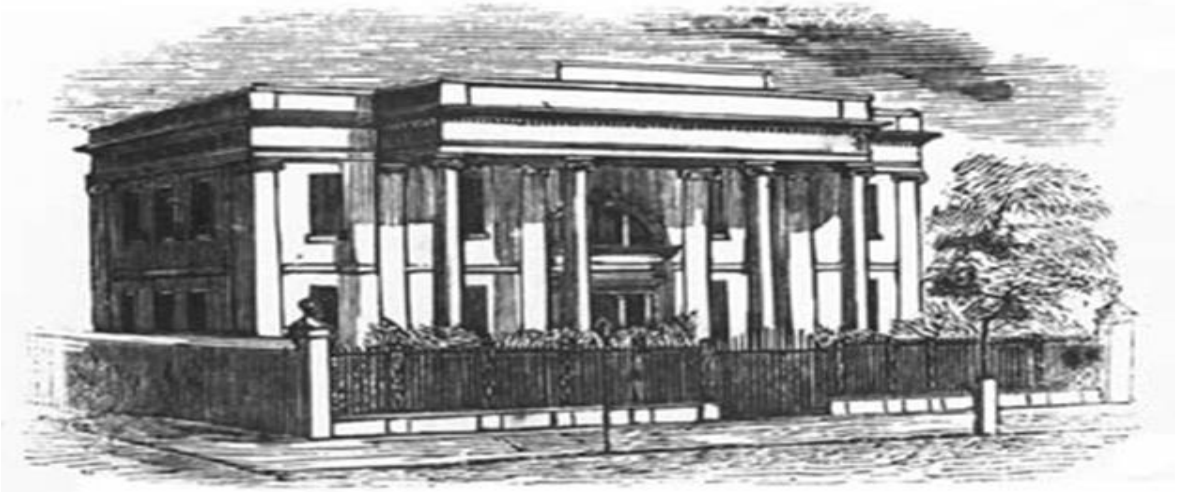
WELCOME TO THE **MEDICAL UNIVERSITY OF SOUTH CAROLINA**

Donna Kern, MD
Senior Associate Dean for Medical Education
Assistant Dean for Patient Safety and Simulation



Medical College of South Carolina
Circa 1824

Medical University of South Carolina

College of Medicine

College of Dental Medicine

College of Health Professions

College of Nursing

College of Pharmacy

College of Graduate Studies

Leading health innovation for the lives we touch.

MUSC Strategic Goals

- Advance New Knowledge and Scientific Discoveries
- Embrace Diversity and Inclusion
- **Foster Innovative Education and Learning**
- Commit to Patients and Families First
- Build Healthy Communities

2019-2020: For the fifth year in a row, U.S. News & World Report has named MUSC Health the top hospital in SC in the “Best Hospitals” rankings. There are rougly 90 hospitals in South Carolina.

MUSC Leadership

David J. Cole, MD
President
Medical University of South Carolina

Raymond DuBois, MD, PhD
Dean
MUSC College of Medicine

Lisa Saladin, PhD
Provost
Medical University of South Carolina

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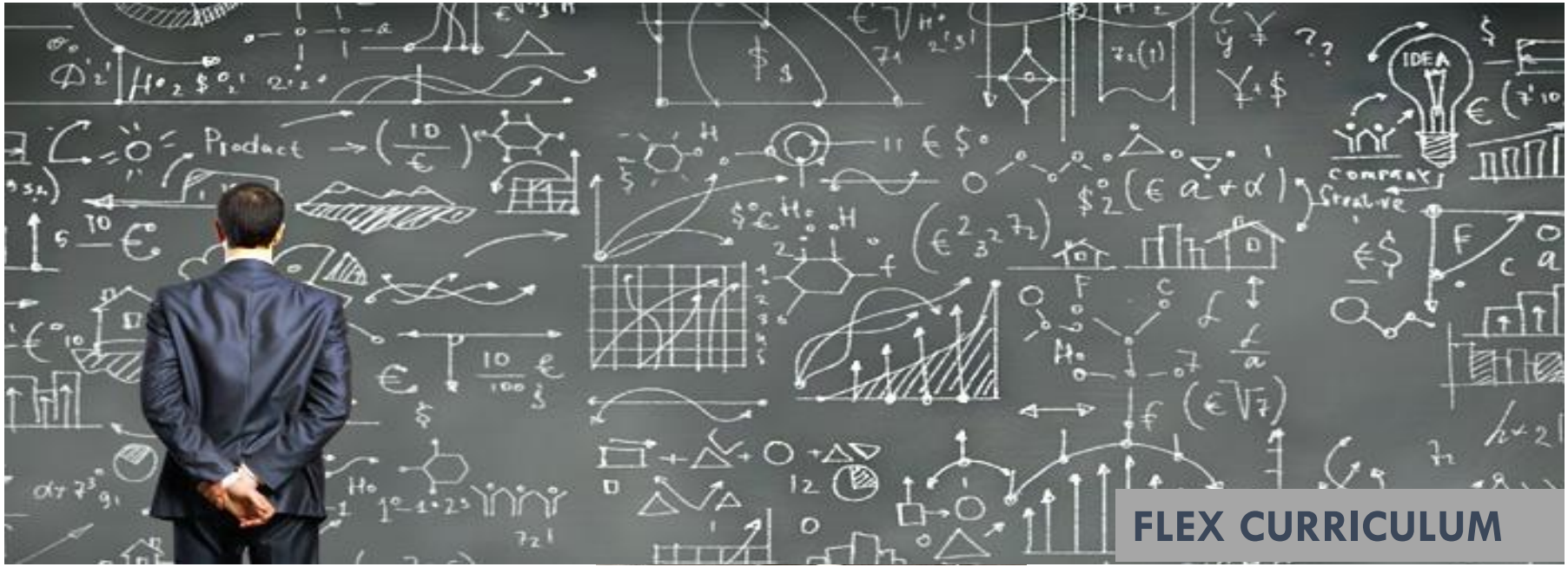
Embrace Diversity and Inclusion

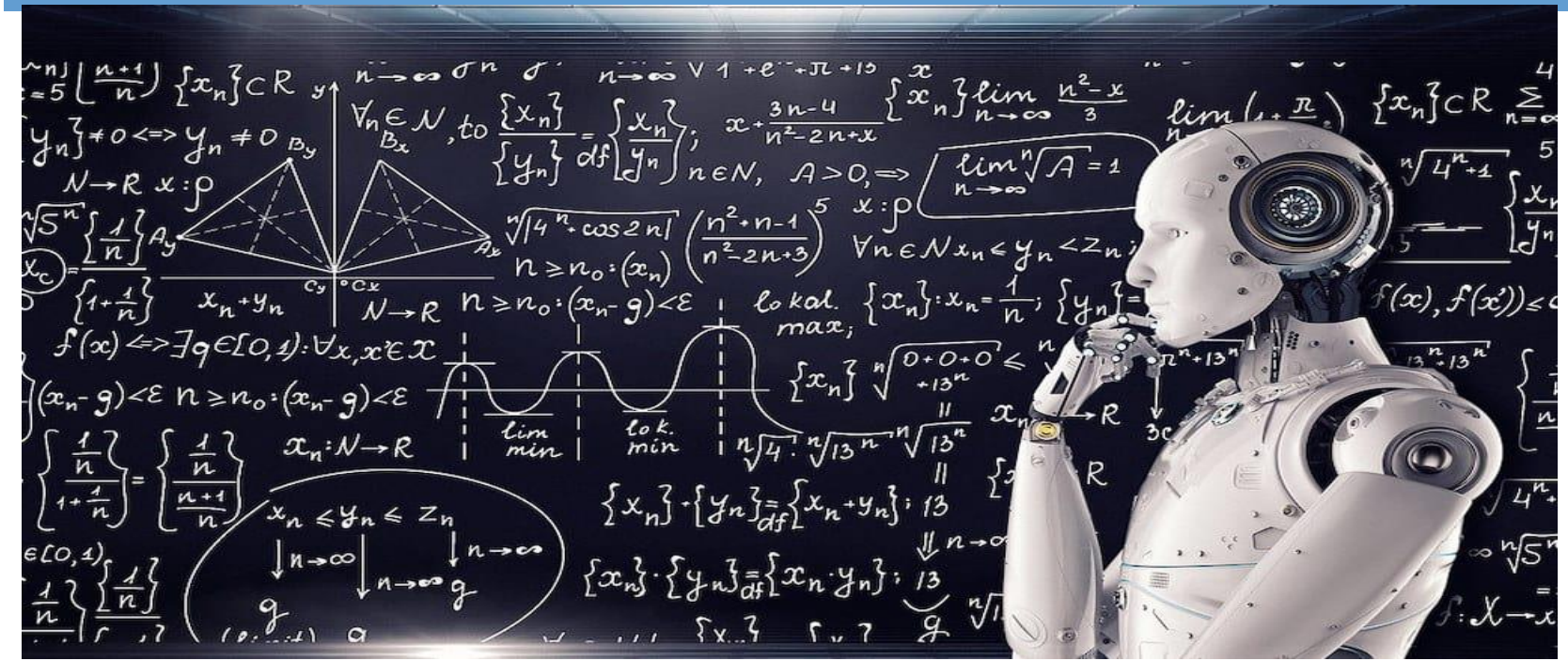
- Associate of American Medical Colleges (AAMC) Diversity Award
- National recognition - US News and World Report
- Students EXCELLING and THRIVING

The Future of Health Care

“Knowing is not enough; we must apply.
Willing is not enough; we must do.” - Goethe

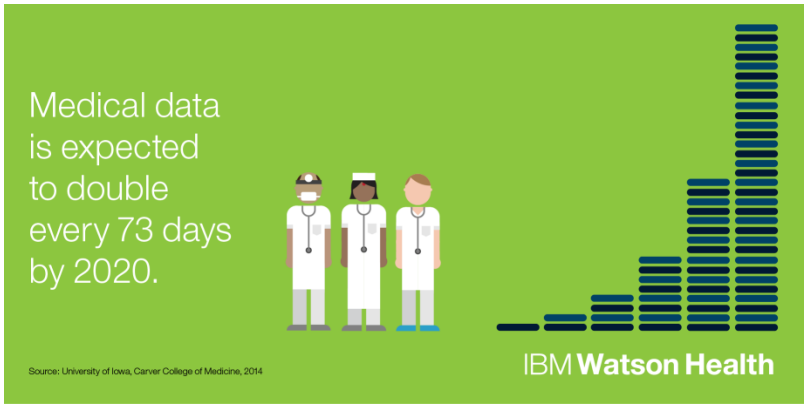


The Next Curriculum?



The Data Problem

- Information growing at unprecedented rate
- Devices: wearable, personal, implantable
- Average person generates more than 1million gigabytes of health-related data in their lifetime
  - Equivalent to **300 million books**



Harnessing Volumes of Data

- **Computing power**> complex data sets
- **Clouds**> large aggregate data sharing
- **Computing analytics**> make meaning out of data “chaos”
- **Cognitive computing systems**> learn and interact naturally with people to extend what either humans or machine could do on their own.
- ***Helping humans experts be better and make better decisions - IBM***

Intelligent Drug Discovery

- New drugs + New uses for old drugs
- New target therapies based on genetic data
- Decrease antibiotic resistance
- Personalized cancer care
- Matching patients to clinical trials

AI Predictive Modeling

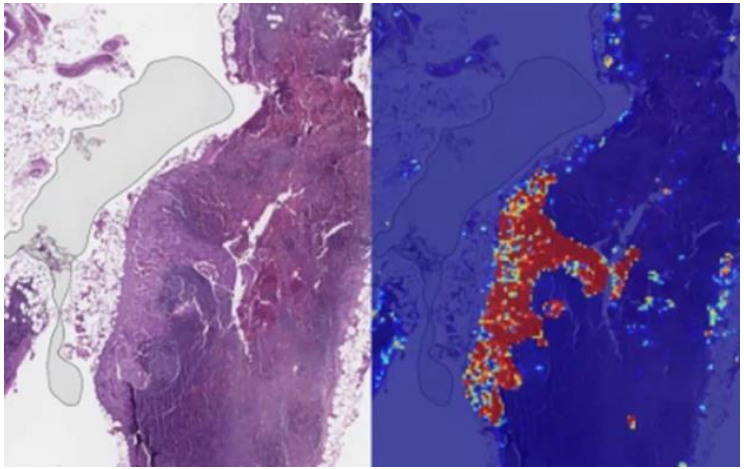
- Brad Jones, MD, PhD, Harvard Medical School
- Undiagnosed Disease Network
- 4-year old boy with inflammatory bowel disease that was life threatening
  - No drugs worked; surgery to remove colon recommended.
  - Analyzed cells against millions of genetic data points
  - Predictive modeling of substances/drugs that switch those genes on/off.
  - Patient matched a small population that respond to indirubin (indigo).

Tizhoosh HR, Pantanowitz L. Artificial Intelligence and Digital Pathology: Challenges and Opportunities. Journal of Pathologic Informatics.

AI Visual Systems

Identify patterns that escape the human eye.

- Google AI developed a cancer-detecting algorithms that **autonomously evaluates lymph node biopsies with 99% accuracy.**

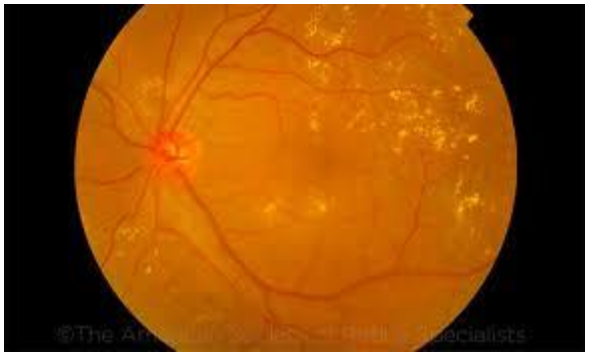


Humans missed diagnosis up to 62% of time.

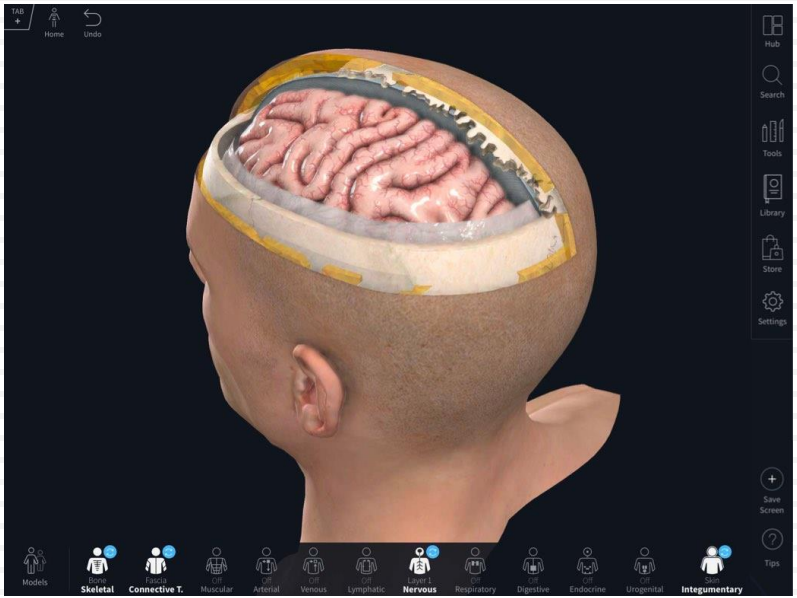
Tizhoosh HR, Pantanowitz L. Artificial Intelligence and Digital Pathology: Challenges and Opportunities. Journal of Pathologic Informatics.

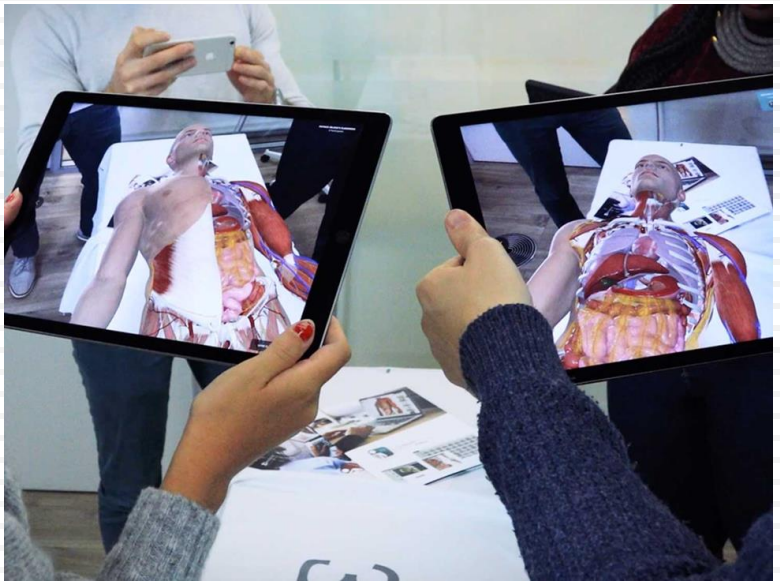
AI Visual Systems

- Graphical Processing Units (GPUs) are highly specialized electronic circuits for fast processing of pixel-based data.
- Machine learning = machines learn from the data we feed them.
- 2018- FDA approved computer to analyze and diagnose diabetic retinopathy.



MEDICAL EDUCATION and AI





Augmented/Virtual Reality/Simulation

- New ways to provide learners with immersive experiences.
- Safe, controlled environment in which learners can be "responsible" for patient care.
  - Training in rare events, complex cases
  - Demonstrate expertise/competency to gain access to "real" patient care experiences
- **Deep learning algorithms in education**

Learners of the Future

- Discern what information…
  - they need to “know”
  - they can “access” as needed
  - how to find information and critically appraise information.
- STEM with emphasis on problem solving

Learners of the Future

- "Mathematics is the language in which God has written the universe." – Galileo Galilei
  - Learners should speak this "unreasonably effective" language
  - **Logic and statistics** should be brought to life in meaningful and practical ways
- Able to reason, interpret, and make decisions using data
- Antidote to discomfort with Uncertainty >> Nurtures equipoise

What makes humans valuable

What if AI is better at being “human”?

- Empathic communication
- Ethical decision-making
- Altruism
- Curiousity