Conflicts of interest
• UW-Madison consultant
• Chair, Society of Imaging Informatics in Medicine

1. What is Informatics?
2. What does an Imaging Informaticist do?
3. How does that compare to Medical Physics?
4. What does the Society of Imaging Informatics in Medicine do?
5. What are the major challenges in this field?
"This ubiquitous and critical nature of IT and informatics means that radiologists, physicists, and radiology executives need to become more IT savvy."


Biomedical informatics (BMI) is the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health.

Biomedical Informatics Model (Shortliffe 2001)
Fields of Biomedical Informatics

Major forces of change

Where Imaging Science meets Data Science

SIIM is an Interdisciplinary society of imaging technology leaders in partnership with the industry making an impact on patient care

- Physicians
- Technologists
- Computer scientists
- Physicists
- IT professionals
- Administrators
- Industry
From a highly technical data center keep-the-lights blinking role...

To a critical liaison role in clinical environments

What does a Imaging Informatics Professional do?

ABII Mission and Purpose

**Mission:** Enhancing patient care, professionalism, and competence in imaging informatics

**Purpose:** The Imaging Informatics Professional Examination assesses the knowledge and cognitive skills underlying the successful performance of job responsibilities required of an imaging informatics professional in a health care setting.
Which are the hardest areas?


Ben Babcock, PhD, ABII psychometrician
"Certification through the American Board of Imaging Informatics can be used as validation of an individual's qualification as a qualified imaging informatics professional."

"When interpreting studies, the vast quantity of lesion-, patient-, and population-specific data contained in the EMR exceeds the ability of a radiologist to meaningfully incorporate into interpretation."

"Big Data and the Future of Radiology Informatics"

Path to Outcomes

- Indications
- Observations
- Recommendations
- Outcomes
# Imaging Science

- Medical Physics
- Image processing
- Computer vision
- Image segmentation
- Organ atlasing

https://en.wikipedia.org/wiki/Medical_image_computing#/media/File:MeningiomaMRSegmentation.png
# Linking the electronic medical enterprise

<table>
<thead>
<tr>
<th>Computer Order Entry</th>
<th>Image Analysis and Communication Systems</th>
<th>Image recognition reporting system</th>
<th>Electronic Medical Records</th>
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</thead>
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1. Structure clinical data into queryable forms.

2. Recommend use of a common data model but also support customization for the variability and availability of EHR data among sites.


4. Implement set operations and relational algebra.

5. Represent phenotype criteria with structured rules.

6. Support defining temporal relations between events.

7. Use standardized terminologies, ontologies, and reuse of value sets.

8. Representations: text searching and natural language processing

9. Interfaces for external software algorithms.

10. Maintain backward compatibility.