

RADIOMICS: ADVANCES IN THE USE OF QUANTITATIVE IMAGING USED FOR PREDICTIVE MODELING

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Radiomics: the dream

- Image details ('features') can be
 - Quantified
 - Used to build decision support tools, e.g.: the risk of distant metastases, or the likelihood of treatment response
- Quantification can capture
 - Variability
 - Well-defined, yet subtle features
- Can expose the biological phenotype
- Already used in breast CAD!



Radiomics: the nightmare

- Image features are
 - Dependent on details of imaging devices, reconstruction algorithms, and protocols
 - Sometimes incomprehensible
 - Subject to image noise
- Datasets are too small
- Machine learning results when set of features > data can be misleading
- Relationship with underlying biology is usually opaque
- Radiomics researchers use different features, datasets, and model building method
- Progress is likely to be incremental



Radiomics: requires teamwork

- Data sharing/pooling
- Model/results sharing
- Software sharing
- Standard set of features as a baseline
- Cross-vendor quantitative imaging methodologies
- Progress will likely be steady


