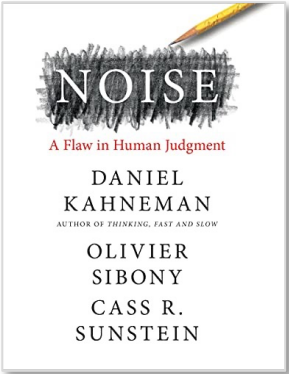
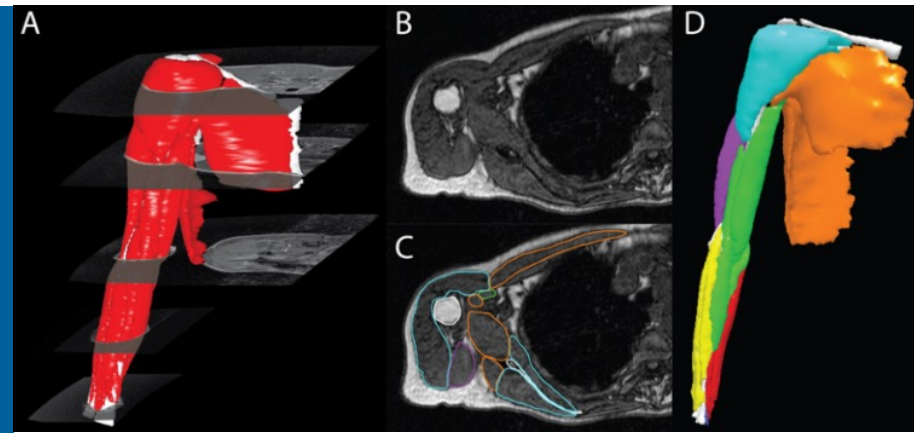
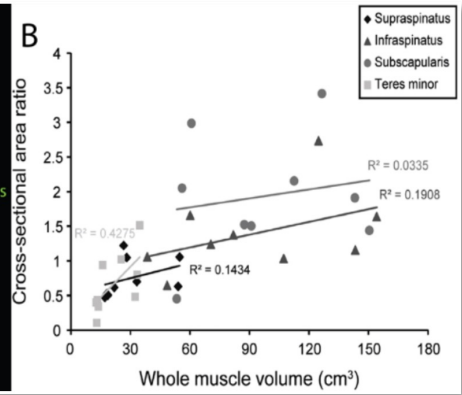
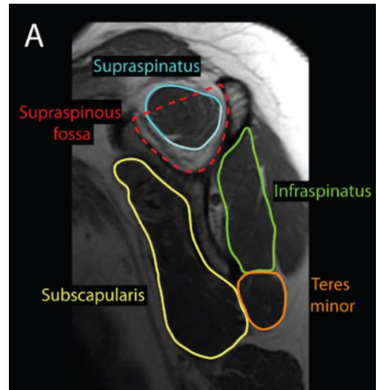




AUTOMATIC MRI SEGMENTATION FOR UPPER LIMB MUSCLES FOR CLINICAL APPLICATIONS



Rotator cuff atrophy is clinically assessed in 2D. The boundary of each muscle is traced on a standardized slice and muscle area - calculated with standard image viewing software - is divided by the area of the supraspinous fossa.



While this is a straightforward calculation with repeatable anatomical landmarks, it is uncorrelated to the actual 3D muscle volume.

Collaboration



Department of Health and Human Services
National Institutes of Health
NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL
AND SKIN DISEASES



Northwestern
University



National Institutes
of Health

Shirley Ryan
AbilityLab

Argonne
NATIONAL LABORATORY

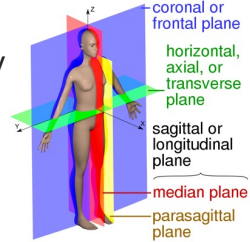


NC STATE UNIVERSITY

Automatic MRI segmentation for upper limb muscles for clinical applications

Nature of Work

- **Aim 1.** Identify the machine learning techniques with the best accuracy and performance for automatic segmentation of individual muscles in the upper limb from MR images.
- **Aim 2.** Identify model generalizability and performance for analysis of parasagittal plane images.



Award

1R21AR080953-01

9/1/2022 – 7/31/2024

Challenges

Data heterogeneity

Human Research Subjects

↳ HRP-599, DOE IRB

NAISE Joint Appointments

MRI data & resolution

DL algorithms

Future Work

Explore more collaborations with Shirley Ryan AbilityLab and NU scientists to boost the clinic and applied sciences.

Submit challenge on IEEE ISBI
International Symposium on Biomedical Imaging

Targets

- Share, publish, verify, reproduce, and reuse the models developed in Aims 1 and 2.



DLHub
Data and Learning
Hub for Science

- Explore ALCF AI Testbeds and evaluate performance on != architectures and w/ != algorithms.
- Train NU students in HPC and world-class facilities.
- Boost collaborations with local institutions