

class project - ME337 - mechanics of growth

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*neuromuscular
biomechanics lab*

joseph c. doll

scott delp

amir shamloo

kate holzbaur

ryan p. jackson

human

chun hua zheng

performance lab

nathaniel a. benz

thor bezier



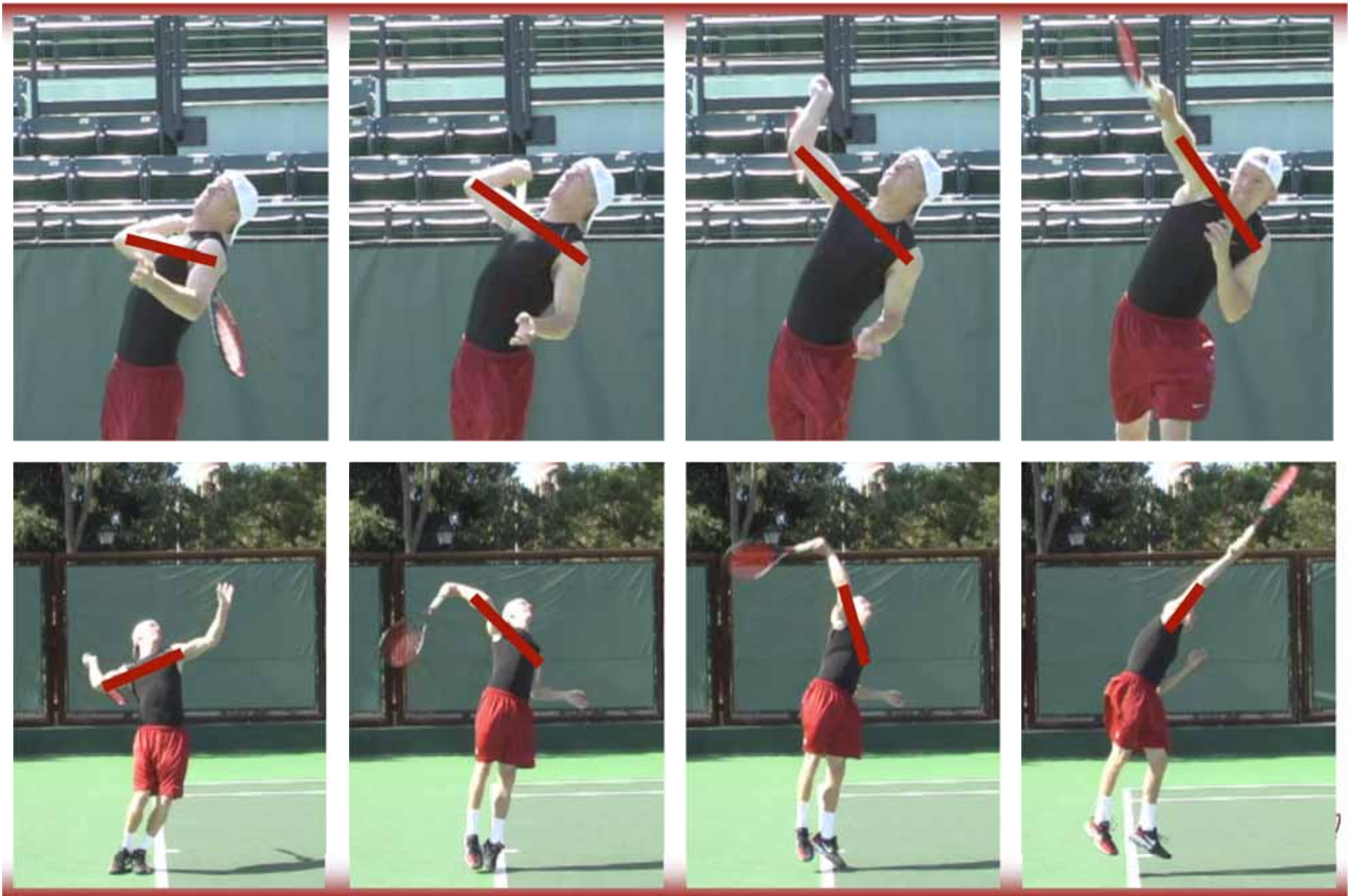
inter-arm asymmetry in tennis players



some cool stuff - the tennis player project ¹

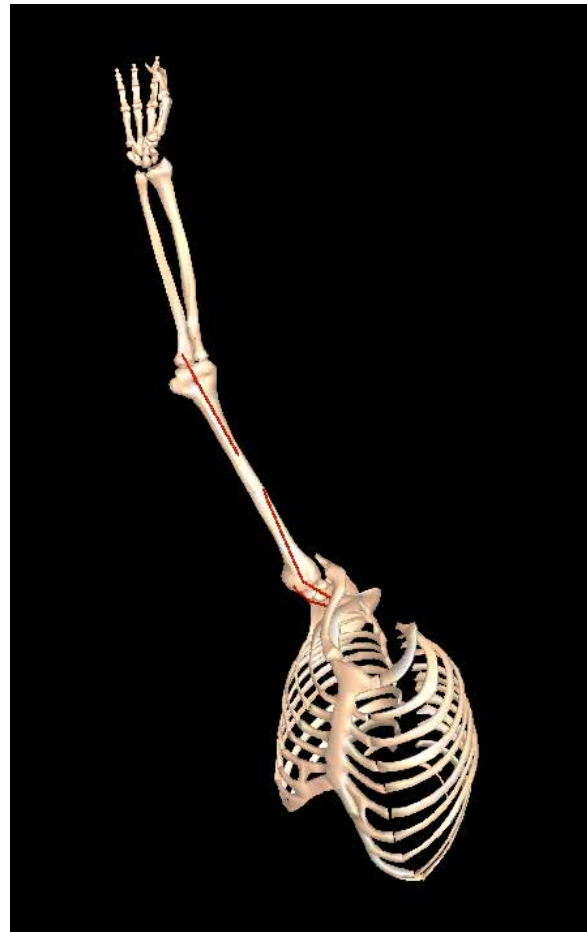
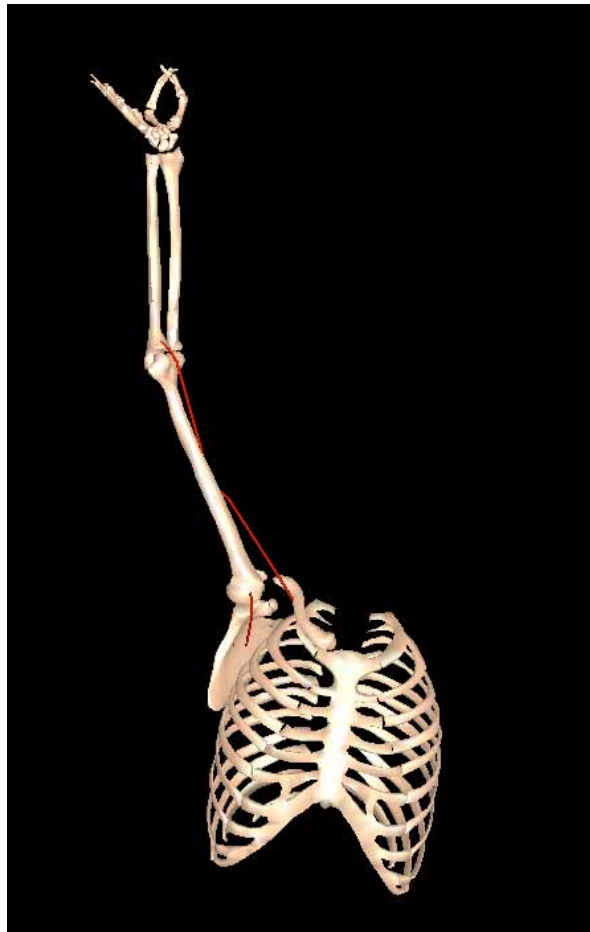


some cool stuff - the tennis player project ²



some cool stuff - the tennis player project ³

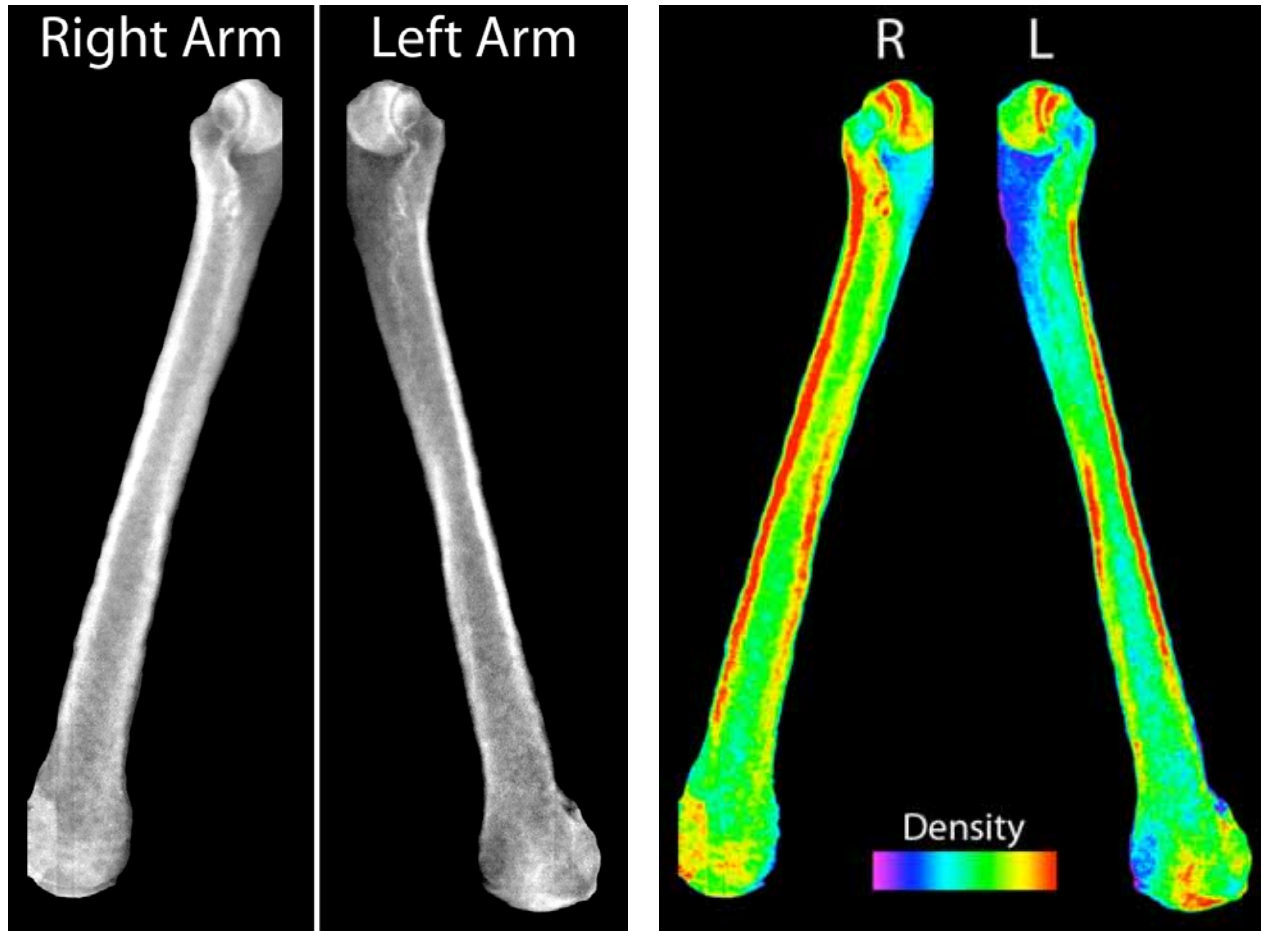
critical muscle forces during serve



SCOTT DELP - NEUKOMUSCULAR BIOMECHANICS LAB - STANFORD

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inter-arm asymmetry in bone density



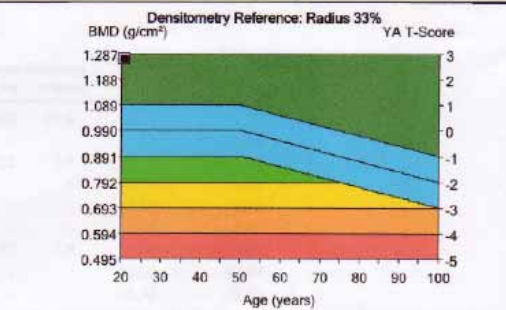
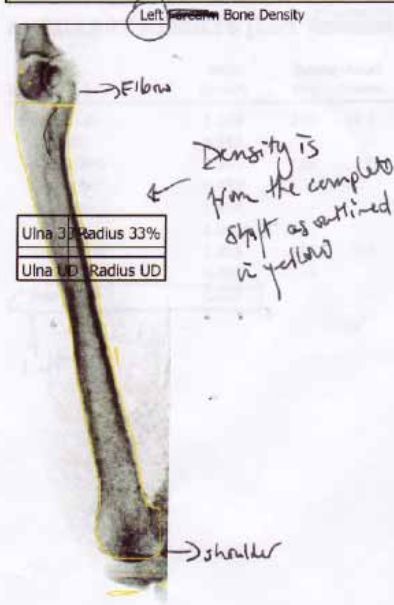
THOR BESIK - HUMAN PERFORMANCE LAB - STANFORD

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inter-arm asymmetry in bone density

Stanford University Sports Medicine Clinic
341 Galvez Street
Stanford, CA 94305

Patient: [redacted] 20.5 years
Birth Date: [redacted]
Height / Weight: 73.0 in. 165.0 lbs.
Sex / Ethnic: Male White
Facility ID: [redacted]
Referring Physician: [redacted]
Measured: 5/17/2007 10:19:08 AM (11.20)
Analyzed: 5/17/2007 10:49:44 AM (11.20)



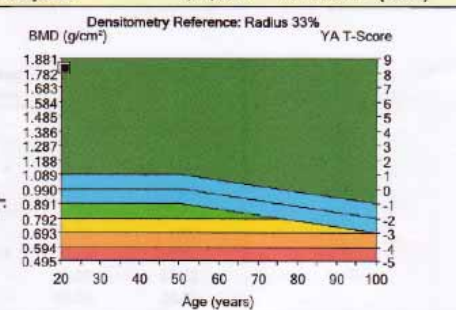
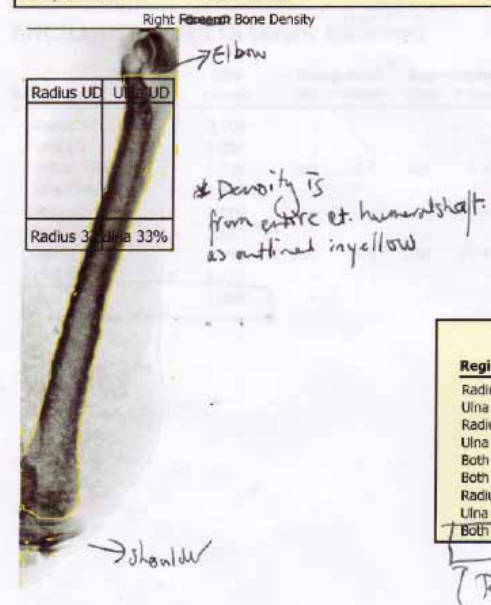
Region	BMD ¹ (g/cm ²)	Young-Adult ² T-Score	Age-Matched ³ Z-Score
Radius UD	1.249	14.4	14.4
Ulna UD	1.112	-	-
Radius 33%	1.266	2.8	2.8
Ulna 33%	0.933	-	-
Both UD	1.194	-	-
Both 33%	1.046	-	-
Radius Total	1.255	7.4	7.4
Ulna Total	0.986	-	-
Both Total	1.107	-	-

Left (non-dominant). this is what you want, complete shaft

COMMENTS:

Stanford University Sports Medicine Clinic
341 Galvez Street
Stanford, CA 94305

Patient: [redacted] 20.5 years
Birth Date: [redacted]
Height / Weight: 73.0 in. 165.0 lbs.
Sex / Ethnic: Male White
Facility ID: [redacted]
Referring Physician: [redacted]
Measured: 5/17/2007 10:29:33 AM (11.20)
Analyzed: 5/17/2007 10:45:38 AM (11.20)



Region	BMD ¹ (g/cm ²)	Young-Adult ² T-Score	Age-Matched ³ Z-Score
Radius UD	0.000	-	-
Ulna UD	1.189	-	-
Radius 33%	1.816	8.4	8.4
Ulna 33%	1.406	-	-
Both UD	1.189	-	-
Both 33%	1.552	-	-
Radius Total	1.766	14.9	14.9
Ulna Total	1.337	-	-
Both Total	1.369	-	-

(Right)

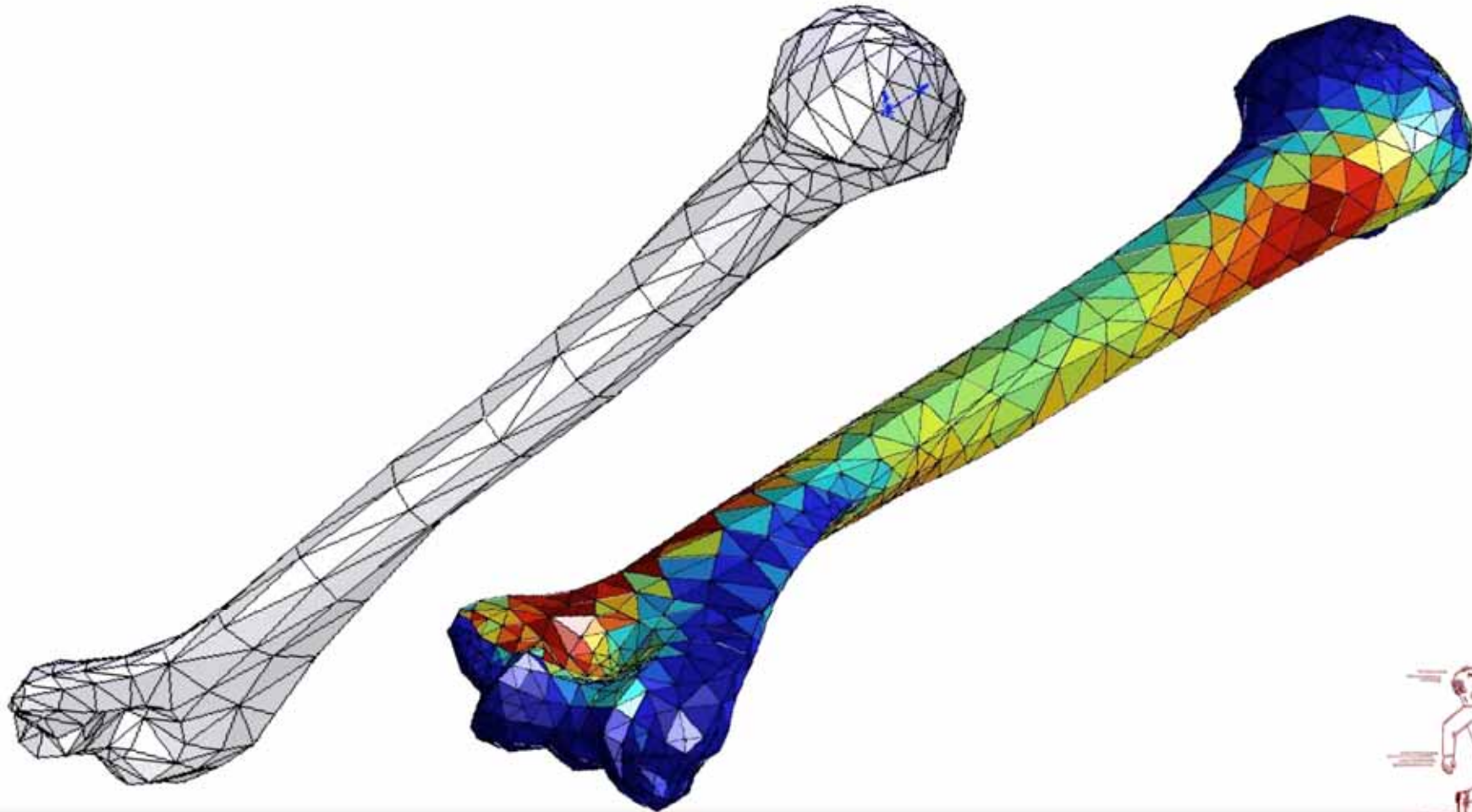
COMMENTS:

bmd left 1.107g/mm²

bmd right 1.369g/mm²

some cool stuff - the tennis player project 6

finite element simulation of density growth



some cool stuff - the tennis player project 7