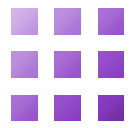# Sports Engineering

Session Chairs

Patrick Drane

Baseball Research Center – University of Massachusetts Lowell

Yasuo Nakamura

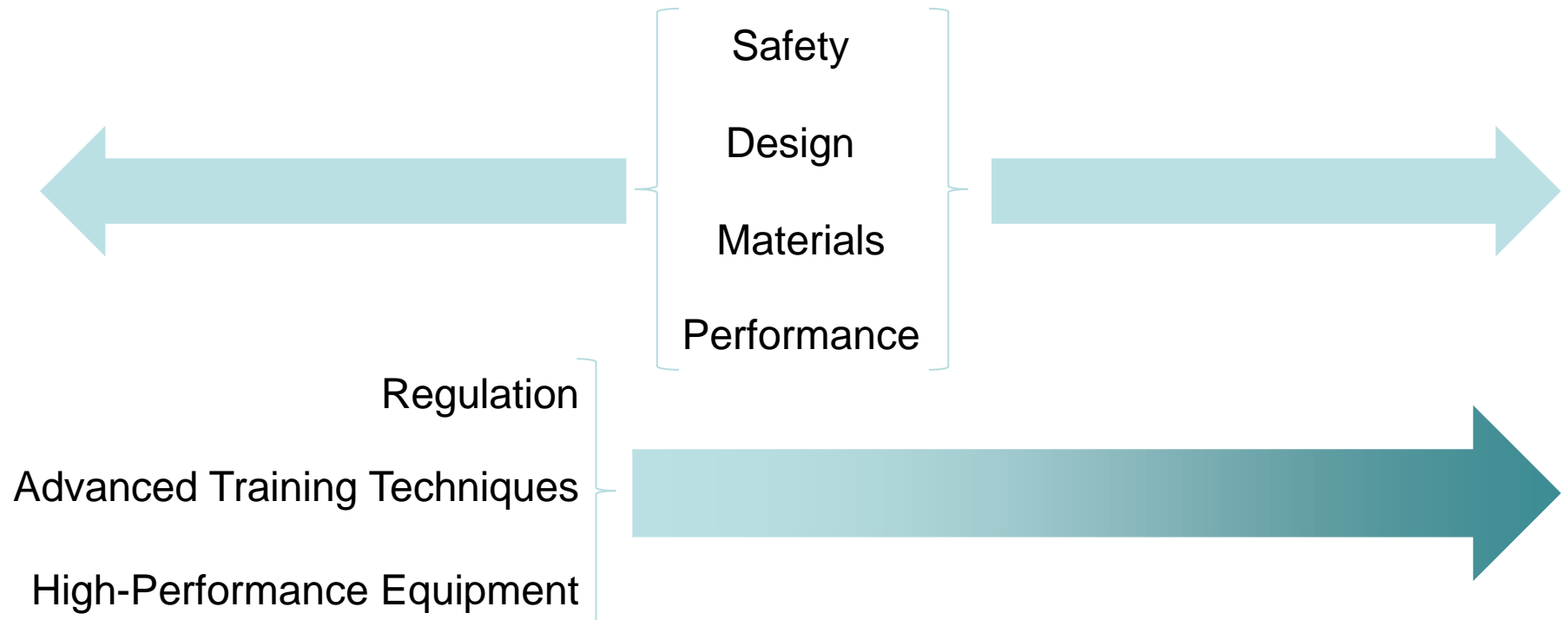Health and Sports Science – Doshisha University

Sports Engineering

Why do people play sports?

Health Promotion	Recreation	Amateur Competition	Professional Competition

Safety

Design

Materials

Performance

Regulation

Advanced Training Techniques

High-Performance Equipment

Science   Engineering

Sports Engineers are responsible for the study, analysis, design and understanding required to ensure the progress of **safety** and **performance** in sport (equipment and body motion).
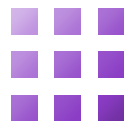
Aerodynamics   Dynamics   Material Development   Modeling
          Biomechanics   Instrumentation   Measurement

Popular Sports

USA: 1. American football,   2. Baseball,
          3. Basketball,   4. Ice hockey

The Gallup Organization(2008)

People may participate in several sports.

Sports will be selected depending on season.
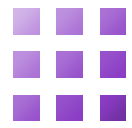
Japan: 1. Baseball,   2. Soccer,
           3. Golf,   4. Sumo (national sport)

Central Research Service, Inc. Japan(2012)

People usually participate in one sport.

Initially, Physical education of school curriculum
Then, Independent club(sports) activities

Physique Difference

USA (Age:20-29)

Male   177.6cm (5ft 10in) 85.4kg (188.3 lbs)

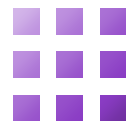Female 163.2cm (5ft 4in)   70.7kg (155.9 lbs)

National Health Statistics Reports 10, 2008 (2003-2006)

Japan (Age:17)

Male   170.7cm (5ft 7in)   63.1kg (139.1 lbs)

Female 158.0cm (5ft 2in)   52.8kg (116.4 lbs)

Ministry of Education, Culture, Sports, Science & Technology in Japan (2011)
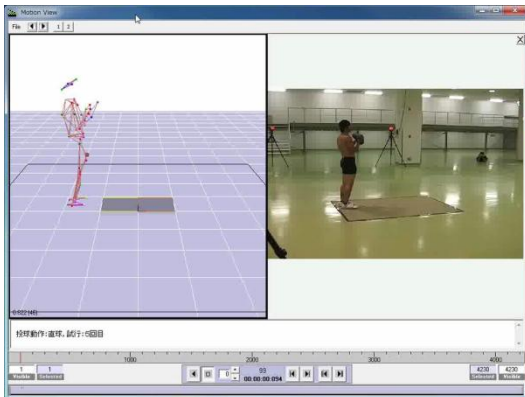
Session Topics

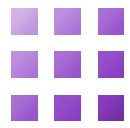## 1. Developments of sports equipment

Improvement of
safety and performance
for sports goods
 (i.e. Footwear, Bats, helmets etc.)

2. Human body movement (Biomechanics)

Measuring body movement

Performance evaluation

Training

Speakers

Developments of sports equipment
    Kenta Moriyasu, ASICS Corporation
        Functional Footwear Design
    Matt Vacek, Jarden Team Sports
        State-of-the-Art Composite Design and
        Manufacturing for Sports Equipment

Human body movement
    Allison Sheets, Nike
        Dynamics and Biomechanics in Sports
    Kei Aoki, National Institute of Advanced
        Industrial Science and Technology
        Biomechanical Analysis of Motion of
        Professional Baseball Pitchers