

JSB Newsletter

Topics

- Visit the Laboratory of JSB members
- Introduction of JSB researchers
- Publications from JSB members

<https://biomechanics.smo.osy.atlas.jp/en>

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Upcoming event

- JSB annual meeting in Chukyo University: Nov 31- Dec 1, 2024

Visit the Laboratory of JSB members

Motor Control Lab, Prefectural University of Kumamoto

Our laboratory investigates how the brain controls movements of the body, in particular, hand and finger movements. A longstanding line of investigation has studied kinetics during tapping tasks in healthy young adults, healthy elderly adults, and pianists. Currently, we are working on projects that investigate kinematics during iPod manipulation and grasping movements with dominant and non-dominant hands.



Experiment in the lab



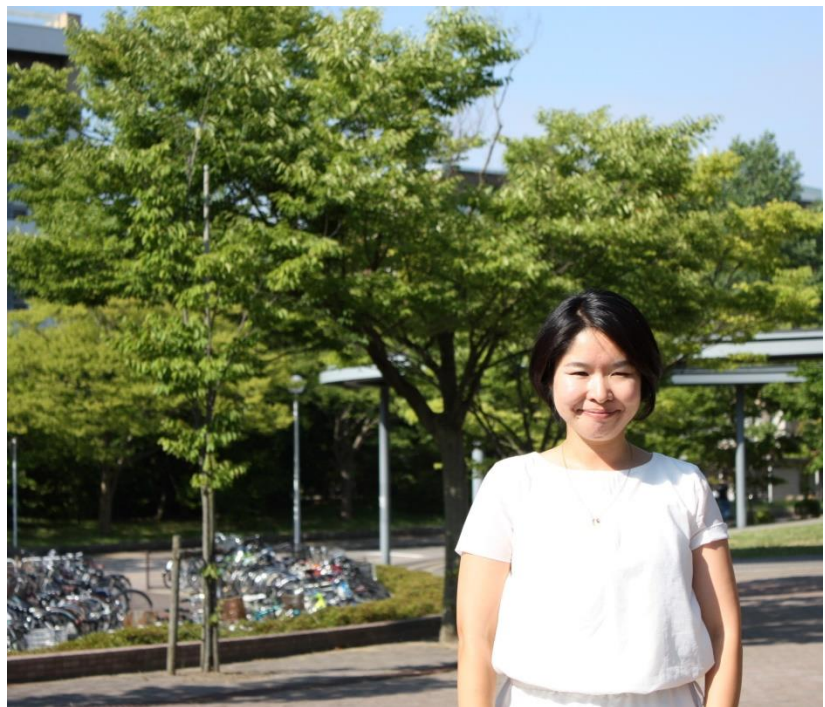
Lab director, Prof. Tomoko Aoki (right)

Introduction of JSB researcher

I am Yoko Kunimasa, Assistant Professor at the faculty of education and the faculty engineering, Niigata University. My area of expertise are muscle-tendon architecture and function and neuromuscular mechanics. Since I was an undergraduate student, I have been interested in biomechanics, how our human body moves efficiently with our unique anatomy, physiology and mechanics. Then, I finished my PhD in Sport Science at Osaka University of Health and Sport Sciences where I was supervised by Prof. Masaki Ishikawa. In my PhD, I was researching there in-vivo human muscle-tendon architecture and function, especially in elite athletes such as middle- and long-distance runners. After several years working as a post-doc and research assistant in his lab, I moved to France and started working as a post-doc at Institut des Sciences du Mouvement, Aix-Marseille University. I worked there with Prof. Caroline Nicol and Dr. David Bendahan and their teams to research the recovery pattern of muscle-damage after endurance running using ultrasound and MR images. After I finished my post-doc there, I start my new career at Niigata University in Japan by launching my own laboratory as a PI. I am still excited combining the anatomy, physiology, and biomechanics to understand our efficient movements and locomotion. I am also glad to keep working with French team now on these topics and continue the exchange our knowledge, techniques, and young researchers after I came back to Japan.

Yoko Kunimasa

Niigata University




Publications from JSB members


In this newsletter, we are featuring a research paper authored by members of the Japanese Society of Biomechanics. We are pleased to announce that the research paper titled "Relationship Between Jump Height and Lower Limb Joint Kinetics and Kinematics in Elite Male Athletes" by Kotaro Shинchi and colleagues has been published in *Sports Biomechanics* (April 2024). This study investigated the relationship between countermovement jump (CMJ) height and the kinetic and kinematic parameters of the hip, knee, and ankle joints using two-dimensional motion analysis among 66 international-level male athletes from various sports disciplines. The findings revealed that athletes with higher CMJ height also exhibited higher peak hip torque and power, as well as greater angular velocities of the hip and knee joints. This research offers valuable insights for developing effective training programs, particularly in sports that demand explosive lower-limb power.

This study was based on work presented by Kotaro Shинchi (Graduate School of Health and Sports Science, Juntendo University) at the 27th Japanese Society of Biomechanics conference (Juntendo University, 2021) and was further developed by Daichi Yamashita (Japan Institute of Sports Sciences) in his symposium presentation. The impressive sample size of 66 international-level athletes was achieved thanks to the development of an original tracking system using two-dimensional motion analysis combined with deep learning for automatic tracking, which was utilized as a training support tool for the international-level athletes.






Looking ahead, this research could pave the way for more advanced athlete performance optimization strategies by integrating biomechanics with cutting-edge technology.

SPORTS BIOMECHANICS
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 **Routledge**
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Relationship between jump height and lower limb joint kinetics and kinematics during countermovement jump in elite male athletes

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