

**College of Health and Human Development**  
**Faculty Research Themes**

**Biomechanics and Motor Control**

*John Challis*

**Associate Professor**

**Kinesiology**

Email Address: **JHC10@PSU.EDU**

Research Interests

Measurement and simulation modeling of the human musculo-skeletal system, with the aim of examining the role, function, and coordination of muscle in vivo. Development of improved biomechanical measurement protocols.

*Robert Eckhardt*

**Professor**

**Kinesiology**

Email Address: **EYL@PSU.EDU**

Research Interests

Interaction of genetic and environmental influences on growth and development in human populations; musculo-skeletal structures are of primary interest. Current study techniques emphasize computer imaging and analysis of two-dimensional and three-dimensional data representing anatomical structures. Particular emphasis is placed on integration of molecular and morphological perspectives on development.

*Mark Latash*

**Distinguished Professor**

**Kinesiology**

Email Address: **MLL11@PSU.EDU**

Research Interests

Control and coordination of multi-element systems participating in the production of voluntary movements. Equilibrium-point hypothesis of motor control. Control of posture, multi-joint reaching, finger coordination, and other motor tasks; the neurophysiological mechanisms of the production of voluntary movements. Changes in motor control and coordination with age, neurological disorder, and rehabilitation.

*Philip Martin*

**Professor and Department Head**

**Kinesiology**

Email Address: **PMARTIN@PSU.EDU**

Research Interests

Biomechanics and energetics of locomotion; factors affecting preferred rates of movement in cyclic activities, with particular emphasis on the biomechanics and economy of walking, running, and cycling; kinematic and kinetic determinants of walking and running patterns in below knee amputees.

*Karl Newell*

**Professor and Associate Dean**

**Deans Office**

Email Address: **KMN1@PSU.EDU**

Research Interests

Coordination, control and skill of normal and abnormal human movement across the life-span; development of coordination, acquisition of skill, information and movement dynamics, mental retardation and motor skills, drug exercise influences on movement control.

*Stephen Piazza*

**Associate Professor**

**Kinesiology**

Email Address: **STEVE-PIAZZA@PSU.EDU**

Research Interests

Kinematic and dynamic computer simulation applied to the study of normal and pathological human gait; effects of design and surgical variation on the mechanics of total knee replacements; modeling of articular contact.

*Robert Sainburg*

**Associate Professor**

**Kinesiology**

Email Address: **RLS45@PSU.EDU**

Research Interests

Neural mechanisms underlying control of multijoint arm movements in humans. We combine both psychophysical experiments and biomechanical simulations to determine the neural processes responsible for coordinating the complex mechanics of the musculoskeletal system. Studies in patients with neurological lesions are conducted to determine the contributions of specific neural structures to control.

*Neil Sharkey*

**Professor**

**Kinesiology**

Email Address: **NAS9@PSU.EDU**

Research Interests

Functional aspects of the musculoskeletal system viewed from an orthopaedic perspective; normal, pathologic, and reconstructed function of bones and joints; mechanisms of injury to bone, ligament, and tendon and associated healing responses; laboratory modeling of skeletal and diarthroidal joint loading; internal biomechanical behavior of the foot and ankle, knee, hip and

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***Semyon Slobounov***

**Associate Professor**

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Research Interests

**Kinesiology**  
Cognitive and affective aspects of motor skill acquisition, psychological causes and consequences of sport injury, psychological effects of exercise, EEG and voluntary movements, computer graphic visualization of movement dynamics.

***Dagmar Sternad***

**Associate Professor**

Email Address: **DXS48@PSU.EDU**

Research Interests

**Kinesiology**  
Coordination of rhythmic movements, polyrhythmic relations in interlimb coordination, control of interceptive skills, perceptual information for movement control, dynamical modeling of actions, computer simulations of movement kinematics.

***Vladimir Zatsiorsky***

**Professor**

Email Address: **VXZ1@PSU.EDU**

Research Interests

**Kinesiology**  
Sport biomechanics and conditioning of athletes. Biomechanical basis of motor control, in particular biomechanics of standing posture and force sharing between individual muscle groups, maximal muscular power in burst-like activities, RI study of lumbar vertebrae under mechanical load, application of wavelets in human biomechanics, science of training athletes, especially strength training.