



# Mahidol University

## College of Sports Science and Technology

# WEERAWAT LIMROONGREUNGRAT

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## EDUCATION

- PhD 2005 Georgia State University**  
Sports Science
- MSc 1999 Georgia State University**  
Physical Therapy
- BSc 1992 Chiang Mai University**  
Physical Therapy

## PROFESSIONAL EXPERIENCE

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### 2019 - PRESENT

#### Associate Professor

College of Sports Science and Technology  
Mahidol University, Thailand

### 2015 - 2019

#### Assistant Professor

College of Sports Science and Technology  
Mahidol University, Thailand

### 01.02.2017 - 05.30.2017

#### Adjunct Faculty

Texas A&M Texarkana, USA

### 2008 - 2014

#### Instructor

College of Sports Science and Technology  
Mahidol University, Thailand

### 2006 - 2008

#### Postdoctoral Researcher

Division of Physical Therapy, College of Health and Human Science  
Georgia State University, Atlanta, GA

Center for Assistive Technology and Environment Access  
Georgia Institute of Technology, Atlanta, GA

Clinical Researcher, Shepherd Center, Atlanta, GA

### 2006 - 2007

#### Part-time Instructor

Department of Kinesiology and Health  
Georgia State University, Atlanta, GA

### 1999 - 2005

#### Graduate Research Assistant

Department of Kinesiology and Health  
Department of Physical Therapy  
Georgia State University, Atlanta, GA

### 1997 - 1999

#### Graduate Research / Teaching Assistant

Department of Physical Therapy  
Georgia State University, Atlanta, GA

### 1994 - 1995

#### Sale Representative

Scientific Promotion, Co. Ltd  
Bangkok, Thailand

### 1992 - 1994

#### Physical Therapist

Theptarin Hospital, Bangkok, Thailand

## PROFESSIONAL SOCIETIES AND ORGANIZATIONS

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2006 - Present Sports Science Society of Thailand (SSST)  
2009 - Present International Society of Sports Biomechanics (ISBS)  
2008 - Present Asia Society of Sports Biomechanics (ASBS) – Board member  
1992 - Present Thai Physical Therapy Association

## CERTIFICATION

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1996 - Present Thai Physical Therapy Licensure

## TEACHING COURSES

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SIPO 217/201 Basic Biomechanics I for P&O (Undergraduate course, MU)  
SIPO 218/202 Basic Biomechanics II for P&O (Undergraduate course, MU)  
SPSS 379 Sport Biomechanics (Undergraduate course, MU)  
SPSS 484 Sport Injuries and Rehabilitation (Undergraduate course, MU)  
SPSS 551 Sports Biomechanics (Graduate course, MU)  
SPSS 552 Current in Sports Biomechanics (Graduate Course, MU)  
SPSS 554 Applied Sports Biomechanics (Graduate Course, MU)  
SPSS 595 Research Methodology for Sports Sciences (Graduate course, MU)

## TEACHING EXPERIENCES

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KH 3600 Basic Biomechanics (Undergraduate course, GSU)  
KH 4600 Advanced Biomechanics (Undergraduate course, GSU)  
KH 7510 Biomechanics (Graduate course, GSU)

## FELLOWSHIP GRANTS

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### UK RESEARCHES LINKS

British Council, £7,345, Liverpool John Moores University, UK 11/01/14 – 01/31/15

### ENDEAVOUR EXECUTIVE FELLOWSHIP

Endeavour executive fellowship – University of Sydney  
04/13/15 – 08/13/15

## PROFESSIONAL SKILLS

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- 3D Motion analysis system
- Video analysis – Dartfish, Kinovea
- MATLAB, Visual 3D

## GRANTS

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Principle Investigator, 'Balance Training in the Elderly Using Interactive Video Games with a Balance Board' National Research Council of Thailand, ฿228,000, 10/01/11 – 04/30/13

Principle Investigator, 'Monitoring Kicking Performance of Thai National and National Youth Taekwondo Athletes' Sports Authority of Thailand, ฿500,000, 10/01/11 – 09/30/12

Principle Investigator, 'Kinematics Analysis of Wheelchair Basketball Shooting' Research Grant for new researches of Mahidol University, Mahidol University, ฿199,000, 11/01/09 - 10/31/10

## GRANTS (CONT.)

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Principal investigator, 'The Effectiveness of Augmented Immediate Video Feedback on Advanced Wheelchair Skill Training' the National Institute on Disability and Rehabilitation Research (NIDRR), with Wheeled Mobility Rehabilitation Engineer Research Center (RERC), Georgia Institution of Technology, \$131,188, 11/01/08 - 10/31/10

Principal Investigator, 'An Online Video Library & Feedback System for Everyday Transfers in the SCI population' Paralyzed Veteran Affairs Education Foundation, \$99,964, 07/1/08-06/30/10

Co-Principle Investigator, Improving transfer mobility using real-time animation training, from National Institute on Disability and Rehabilitation through contract grant with the Center of Assistive Technology & Environmental Access, Georgia Institute of Technology for \$113,070.00

Co-Principle Investigator, Design and development of EZ push wheelchair, Georgia Research Alliance for \$22,000.00. (10/05-10/06)

## INVENTIONS (US PATENT & INTERNATIONAL PATENT): PUBLICATION NO. 101918268A

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Co-inventor, EZ Push Wheelchair patented by Georgia State University (Utility patent docket number: 220702-1020), this designed wheelchair has more anatomical and mechanical advantages with comparison to the conventional wheelchair, is operated by one hand or two hands and is suitable for stroke patients and/or elderly wheelchair users.

## PUBLICATIONS

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Nanbancha, A., Tretriluxana, J., **Limroongreungrat, W.** & Sinsurin, K. (2019) Decreased supraspinal control and neuromuscular function controlling the ankle joint in athletes with chronic ankle instability. *European Journal of Applied Physiology* 7, 1-12.

Suwannaman, S., Pinthong, M. & **Limroongreungrat, W.** (2019) The effect of unilateral ankle muscle fatigue on postural control in older adults. *Journal of Sports Science and Technology* 19(1), 49-57

Prasertsakul, T., Kaimuk, P., Chinjenpradit, W., **Limroongreungrat, W.** & Charoensuk, W (2018) The effect of virtual reality-based balance training on motor learning and postural control in healthy adults: a randomized preliminary study. *BioMedical Engineering* 17: 124.

Ganokroj, P., **Limroongreungrat, W.**, Kerdsomnuek, P., Riansuwan, K., Keyurapan, E., Wang, YT & Vanadurongwan, B. (2018) Does flooring-type change the gait characteristics of the older adult? Analysis of balance and temporal-spatial gait parameters and ground reaction force *Aging Science & Mental Health Studies* 2(3), 1-8.

Jamkrajang, P., Robinson, MA., **Limroongreungrat, W.** & Vanrenterghem, J. (2017) Can segmental model reductions quantify whole-body balance accurately during dynamic activities? *Gait & Posture* 56, 37-41.

Boonkerd C. & **Limroongreungrat, W.** (2016) Elastic therapeutic tape: Do they have the same material properties? *Journal of Physical Therapy Science* 28 (4), 1303-1306.

Wang, YT, **Limroongreungrat, W.**, Chang, L., Ke, X., Tsai, L., Chen, Y., Lewis, J. (2015) Immediate video feedback on ramp, wheelie, and curb wheelchair skill training for persons with spinal cord injury. *Journal of Rehabilitation Research and Development* 52(4), 421 – 430.

Jamkrajang, P. & **Limroongreungrat, W.** (2014) Comparison of vertical breast displacement between two different sports bra designs Turkish. *Journal of Sports Science* 16 (2), 97-99.

## PUBLICATIONS (CONT.)

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Sinsurin, K., Vachathiti, R., Jalayondeja, W. & **Limroongreungrat, W.** (2013) Different Sagittal Angles and Moments of Lower Extremity Joints during Single-leg Jump Landing among Various Directions in Basketball and Volleyball Athletes. *Journal of Physical Therapy Science* 25(9):1109-1113.

Sinsurin, K., Vachathiti, R., Jalayondeja, W. & **Limroongreungrat, W.** (2013) Altered peak knee valgus during jump-landing among various directions in basketball and volleyball athletes. *Asian Journal of Sports Medicine* 4(3):195-200.

Sanchai, N., Chaunchaiyakul, R., Mingkumlert, S. & **Limroongreungrat, W.** (2009) Wrist and elbow muscle electrical activities during swing phase in amateur and professional golfers. *Journal of Sports Science and Technology* 9(1-2), 29-39.

**Limroongreungrat, W.**, Wang, Y. T., Geil, M. D. & Johnson, J. T. (2009) Technical Note: An instrumented wheel system for measuring 3-D pushrim kinetics during racing wheelchair propulsion. *Research in Sports Medicine: An International Journal* 17, 182-194.

Wang, Y. T., Bernard, R., Clint, C., Chang, L. S., **Limroongreungrat, W.**, & Sprigle, S. H. (2008). Fundamental locomotive activity time efficiency with differently positioning drive-axis wheelchairs among elders. *Journal of Adapted Physical Activity Quarterly* 25(4), 322-34.

Wang, Y. T., Chen S., **Limroongreungrat, W.** & Chang, L. (2005) Contributions of selected fundamental factors to wheelchair basketball performance. *Medicine & Science in Sports & Exercise*, 37 (1), 130-137.

## ONLINE WEBCOURSE

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Co-authors, Evidence-Based Manual Wheelchair Prescription & Practice (2007)  
<http://www.catea.gatech.edu/manualwheelchaircourse/>

## BOOK CHAPTER

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Limroongreungrat, W. & Wang, Y. T. (2014) Three-dimensional pushrim forces during different racing wheelchair propulsion speeds. *Handbook of Ergonomics in Sport and Exercise* Routledge International series.

## PEER REVIEWED PROCEEDINGS (FULL LENGTH)

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Wang, Y. T., Chang, L., & **Limroongreungrat, W.** (2008). Application of biomechanics in physical therapy. *Proceedings of International Sports Biomechanics*, pp 29-33.

Wang, Y. T., Clark, T., Chen, S., Merchant, P., & **Limroongreungrat, W.** (2001). A study of wheelchair basketball players in the 2000 Roosevelt International Basketball Tournament. *The 2nd World Congress Proceedings*, pp 189-193.

## PUBLISHED ABSTRACTS

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Lugue, AM, Santos, N., C Mcconnell, S Bovoonsunthonchai, **W Limroongreungrat**, P Rayothee, K Sasaki (2015) Effects of socket alignment perturbation on the muscle activity and comfort of unilateral transfemoral amputees during level surface ambulation. WCPT Congress 2015, Singapore; 05/2015

Sinsurin, K., Vachalathiti, R., Jalayondeja, W., **Limroongreungrat, W.**: HOW TO CONTROL ANKLE JOINT IN VARIOUS DIRECTIONS OF ONE LEG JUMP-LANDING: FRONTAL PLANE MOMENT AND EMG STUDY. In: Shiang TY, Ho WH, Huang PC, et al., editors. 31st International Symposium on Biomechanics in Sports. Taipei: 2013

Vanasant T, Mingkhumlert S, **Limroongreungrat, W.** The effect of string tension on shuttlecock velocity. In: Shiang TY, Ho WH, Huang PC, et al., editors. 31st International Symposium on Biomechanics in Sports. Taipei: 2013. p. 28–31.

Thumwaree, B., Nana, A., **Limroongreungrat, W.** & Laksanakorn, W. (2011) Effects of 8-week wheelchair Tai Chi training on cardiorespiratory fitness in individuals with spinal cord injury. *Journal of Science and Medicine in Sport* 12/2011.

Thongsumrit, L., Nana, A., **Limroongreungrat, W.** & Laksanakorn, W. (2011) Effects of wheelchair Tai-Chi training on sitting balance of individuals with spinal cord injury. *Journal of Science and Medicine in Sport* 12/2011.

Chottidao, M. & **Limroongreungrat, W.**, (2011) Comparison of Cardiorespiratory function between Single and Double Legs Rope Jumping Exercise. *Medicine Science in Sports & Exercise*, 43(Suppl 1)

**Limroongreungrat, W.**, Sutthajinda, P., Tongaim, R. & Wang, YT (2010) Muscle Activation Patterns of during a Straight Punch of Young Thai National Amateur Boxers. *Medicine Science in Sports & Exercise*, 42.

Netcharoen, N., **Limroongreungrat, W.** & Chottidao, M. (2010) Comparison of Anaerobic Power between Weight Sled Resistance and Interval Trainings in Thai Athletes. *Medicine Science in Sports & Exercise* 42:291-292.

Mingkumlert, S., Vanasant, T., **Limroongreungrat, W.**, Chanchaiyakul, R. & Wang, YT (2010) Effect of core strength and stability training on the X-factor stretch in amateur golfers: *Medicine Science in Sports & Exercise*, 42:677-678.

Chottidao, M. & **Limroongreungrat, W.** (2010) Comparison of Oxygen Uptake between Single and Double Legs Rope Jumping Exercise. *Medicine Science in Sports & Exercise*, 42:547-548.

**Limroongreungrat, W.**, Tongaim R., Kluensuwan A., Chottidao M. (2010) Kinematics Analysis of Female Sabre Fencing Lunge during Competition. *Journal of Sports Science and Technology*, 10 (2) (Supplement)

Jamkrajang P., **Limroongreungrat, W.**, Pinthong M. & Jalayondeja W. (2010) Kinematics and EMG Activities during Free-throw shooting in beginner and advanced wheelchair basketball players. *Journal of Sports Science and Technology*, 10(2) (Supplement)

**Limroongreungrat, W.** Chang, L., Wang, Y. T., Acker, C., Maurer, C. & Sprigle, S. (2009) Effectiveness Of Immediate Video Feedback On Wheelchair Propulsion Training For Patients With Spinal Cord Injuries. *Medicine & Science in Sport & Exercise*, 41(5) p.430

Wang, Y. T., Bernard, R., Cope, C., Chang, L., **Limroongreungrat, W.**, & Sprigle, S. (2008b). Fundamental Locomotive Activity Time Efficiency with Differently Positioning Drive-Axis Wheelchairs among Elderly. *Medicine & Science in Sports & Exercise*, 40(5) Supplement: S447

## PUBLISHED ABSTRACTS (CONT.)

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**Limroongreungrat, W.**, Wang, Y. T., Geil, M. D., Johnson, J. T., Johnson, B. F., & Chang, L. (2007). Comparisons of three-dimensional pushrim forces during three racing speeds of wheelchair propulsion, *Medicine & Science in Sports & Exercise*. 39(5) Supplement: S9.

Chang, L., Wang, Y. T., & **Limroongreungrat, W.** (2007). Relationship between shoulder kinetics and shoulder pain during two speeds of wheelchair propulsion, *Medicine & Science in Sports & Exercise*. 39(5) Supplement: S260.

Wang, Y.T, McSween, L.A., Harris, J.K., **Limroongreungrat, W.**, Chang, L.S.: (2006) Comparison of simulated driving reaction times between younger and older adults. *Research Quarterly for Exercise and Sport*, 77:A18-A18.

Wang, Y. T., Chang, L., **Limroongreungrat, W.**, Bernard, R., Clint, C., & Sprigle, S. (2006). Kinetic analysis of three different drive axis wheelchairs propelled by elderly with arms and legs, *Medicine & Science in Sports & Exercise*. 38(5) Supplement: S268.

**Limroongreungrat, W.**, Cobb, S. C., Chang, L., Zhang, S. & Wang Y. T. (2003) Fundamental factors and performance of female international wheelchair basketball players. *Medicine and Science in Sports and Exercise*, Supplement: 35(5).

Cobb, S. C., **Limroongreungrat, W.**, Tis, L. L. & Higbie, E. J. (2003) Effect of extended custom molded orthotic use on plantar pressure temporal characteristics. *Medicine and Science in Sports and Exercise*, 35(5), Supplement: S237.

Wang, Y. T., Cobb, S.C., Chang, L., **Limroongreungrat, W.** & Zhou, B. (2002). Selected physical and neuromuscular variables between male and female international basketball players. *Medicine and Science in Sports and Exercise*, 34(1), Supplement: S90.

Cobb, S. C., **Limroongreungrat, W.**, McCarthy, S. P., Tis, L. L. & Higbie, E. J. (2002). The Effect of two different custom fabricated corrective orthotics on plantar pressure measures. *Journal of Athletic Training*, 37(2), Supplement: S94.

**Limroongreungrat, W.**, Pascoe, D. D., Wang, Y. T., Cobb, S.C. & Merchant, P. S. (2001). The effects of loadings and suspensions of three book backpacks on static and dynamic posture of youths. *Medicine and Science in Sports and Exercise*, 33(5), Supplement: S152.

## SELECTED PRESENTATIONS

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Mingkumlert, S. Saenchai, S., **Limroongreungrat, W.** & Chaunchaiyakul, R. Upper Extremity EMG during Professional Golf Swing. International Sports Science & Sports Medicine Conference 2009, August 20 -22, Newcastle, England

Tongaim, R., **Limroongreungrat, W.** Hirunrat, S., Phantayuth, D. & Thanangkul, S. Response Time and Jab Force Punch of Thai Female Amateur Boxers: A preliminary Study. The Annual meeting 2009 of International Society of Sports Biomechanics. August, 17 -21, Limerick, Ireland

**Limroongreungrat, W.**, Wang, Y.T., Chang, L., Pinthong, M., Racing Wheelchair Propulsion Efficiency during Three Different Speeds Joint Conference: 4th Asia Pacific Conference on Exercise and Sports Science & 8th International Sports Science Conference 15th – 17th July 2009, July 15 – 17, Kota Bharu, Kelantan, Malaysia.

Chottidao, R.& **Limroongreungrat, W.** Physical Fitness Differences between Securities officer and Information Technology officer in Bank of Thailand Joint Conference: 4th Asia Pacific Conference on Exercise and Sports Science & 8th International Sports Science Conference 15th – 17th July 2009, July 15 – 17, Kota Bharu, Kelantan, Malaysia.



## SELECTED PRESENTATIONS (CONT.)

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Tongaim, R., **Limroongreungrat, W.** Hirunrat, S., Raktavee, P. & Thanangkul, S. Response Time and Jab Force Punch of Thai National Amateur Boxers Joint Conference: 4th Asia Pacific Conference on Exercise and Sports Science & 8th International Sports Science Conference 15th – 17th July 2009, July 15 – 17, Kota Bharu, Kelantan, Malaysia.

**Limroongreungrat, W.**, Chang, L., Wang, Y.T., Acker, C., Maurer, C. & Sprigle, S. Effectiveness of Immediate Video Feedback on Wheelchair Propulsion Training of Patients with Spinal Cord Injuries The 2009 Annual Meeting of the American College of Sports Medicine, May 29 – June 2, Seattle, Washington.

**Limroongreungrat W.**, Wang, Y. T., Geil, M. D., Johnson, J. T., Johnson, B. F. Shoulder joint forces during three different racing wheelchair propulsion speeds. The 2008 International Convention on Science and Medicine in Sport, August 1-4, Guangzhou, China.

**Limroongreungrat W.**, Wang, Y. T., Geil, M. D., Johnson, J. T., Johnson, B. F., & Chang, L. (2007). Comparisons of three-dimensional pushrim forces during three racing speeds of wheelchair propulsion, The 2007 Annual Meeting of the American College of Sports Medicine, May 30 – June 2, New Orleans, Louisiana.

Chang, L., Wang, Y. T., & **Limroongreungrat, W.** (2007). Relationship between shoulder kinetics and shoulder pain during two speeds of wheelchair propulsion, , The 2007 Annual Meeting of the American College of Sports Medicine, May 30 – June 2, New Orleans, Louisiana.

**Limroongreungrat, W.**, Wang, Y. T., Edel, F., & Cobb, S. (2006). Instrumented wheel system for measuring pushrim forces during racing wheelchair propulsion, 2006 AAHPERD National Convention and Exposition, April 25-29, Salt Lake City, Utah.

Wang, Y. T., McSween, L. A., Harris, J. K., **Limroongreungrat, W.** & Chang, L. S. (2006). Comparison of simulated driving reaction times between younger and older adults, 2006 AAHPERD National Convention and Exposition, April 25-29, Salt Lake City, Utah.

**Limroongreungrat, W.** Cobb, S. C., Chang, L. S., Zhang, S., Wang, Y. T. (2003). Fundamental factors and performance of female international wheelchair basketball players, The 2003 Annual Meeting of the American College of Sports Medicine, May 28-31, San Francisco, California.

Wang, Y. T., Chen, S., Clark, T., Chang, L. & **Limroongreungrat, W.** (2003) Contributions of the Selected Fundamental Factors to Basketball Performance for Paralympics Wheelchair Basketball Players. 2003 AAHPERD National Convention and Exposition, April 25-29, Philadelphia, PA.

**Limroongreungrat, W.**, Wang, Y. T., & Hales, M. Joint reaction forces and moments during dynamic analysis of wheelchair propulsion of wheelchair users. 8th GAACPT Bangkok 2002 November 17-20, 2002 Sofitel Central Plaza Bangkok Hotel, Bangkok, Thailand.

Wang, Y. T., Cobb, S., Chang, L., **Limroongreungrat, W.**, & Zhou, B. (2002). Selected physical and neuromuscular variables between male and female international wheelchair basketball players, The 2002 Annual Meeting of the American College of Sports Medicine, May 28-June 1, St. Louis, Missouri.

Wang, Y. T., Clark, T., Chen, S., Merchant, P., & **Limroongreungrat, W.** (2001). A study of wheelchair basketball players in the 2000 Roosevelt International Basketball Tournament. The 2nd World Congress & Exposition on Disability, 28-30, Atlanta, Georgia.

## SELECTED PRESENTATIONS (CONT.)

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**Limroongreungrat, W.**, Pascoe, D. D., Wang, Y. T., Cobb, S. C., & Merchant, P. S. (2001). The effects of loadings and suspensions of three book backpacks on static and dynamic posture of youths, The 2001 Annual Meeting of the American College of Sports Medicine, May 30- June 2, Baltimore, Maryland.

Wang, Y. T., Clark, T., Merchant, P. S., **Limroongreungrat, W.**, & Higbie, E. J. (2000). Three dimensional kinematical features of maximum velocity patterns in wheelchair racing, The 2000 Annual Meeting of the American College of Sports Medicine, May 31- June 3, Indianapolis, Indiana.

**Limroongreungrat, W.**, Imamura, R. T., Wang, V. C., Merchant, P. S., Johnson, B. F., & Wang, Y. T. (2000). Three dimensional kinematical analysis of forehand and backhand strokes in wheelchair tennis, The 2000 Annual Meeting of the American College of Sports Medicine, May 31-June 3, Indianapolis, Indiana.