# ARNEL L. AGUINALDO, M.A., ATC

## SUMMARY

- Experienced biomechanist with a diverse engineering and sports science background
- Proven, effective leader in a multi-disciplinary team-oriented environment
- Results oriented and pragmatic problem solver
- Extensive experience in video analysis, software development, biomechanics, and sports science
- Excels as liaison between technical analysis, coaching, medicine, and sport performance

## EDUCATION

**M.A., Biomechanics & Athletic Training**, San Diego State University (1999)
**B.S., Bioengineering**, University of California, San Diego (1995)

## PROFESSIONAL CERTIFICATIONS

**ATC**, National Athletic Trainers Association Board of Certification (2000-present)

## PROFESSIONAL EXPERIENCE

**Director, Center for Human Performance (CHP)** *June 2004 – present*
**Motion Analysis Laboratory, Rady Children's Hospital, San Diego, CA**
Established and currently direct sports performance institute (CHP) in utilizing motion analysis and other innovative technology to evaluate sport performance for enhancement and injury prevention. Developed research and service based programs in sport performance and successfully studied over 300 athletes since inception, including athletes from Major League Baseball, US Olympic Training Center, golf teams, collegiate sports, and local tri-athlete clubs. Actively pursue and obtain funding from private entities and industry to support ongoing research in sports medicine, sport performance, and clinical gait analysis. Present research through journal publications and talks at scientific conferences. Developed 3D kinematic model and wrote related analysis software (UETrak) currently being used in over 30 facilities to measure biomechanics of upper-extremity motion during sport performance and clinical movement. Frequently work directly with players and coaches through seminars and one-on-one sessions for interpretation of performance analysis.

**Bioengineer** *March 2000 – Jan 2004*
**Motion Analysis Laboratory, Rady Children's Hospital, San Diego, CA**
Supervised all engineering activities of the lab, including the operation and maintenance of all systems used for kinematic and kinetic analyses, electromyography, energy expenditure, and network/database administration. Successfully installed and modified a 12 camera 3D motion capture system to accommodate clinical gait and sports biomechanical studies. Developed biomechanical software for kinematic analysis, calculating mechanical work, and data processing. Simultaneously managed multiple research projects in human locomotion, clinical orthopedics, and sports medicine. Served as technical, research, and educational resource for the lab and the Orthopedics department.

**Student Athletic Trainer** *June 1995 - Dec 1999*
**University of California, San Diego**
Logged over 1500 hours of athletic training activities in support of the sports medicine department and Division II collegiate teams and club sports. Covered various competitive team sports, particularly baseball, softball, women's soccer, volleyball, track and field, rugby, and basketball at all practice, home, and road events and participated in various injury rehabilitation and prevention strategy efforts.

## TEACHING EXPERIENCE

**Assistant Professor, Biomechanics** *Aug 2005 - present*
School of Exercise and Nutritional Sciences, San Diego State University
*ENS 306 – Biomechanics of Human Movement (Undergraduate)*
Introduction to biomechanics and its role in human movement analysis using classical (Newtonian) mechanics to quantify and describe the kinematics and kinetics of whole body and segmental motion. Emphasis is placed on sport performance and clinical gait analysis.
*ENS 630 – Kinematics of Human Movement (Graduate)*
Kinematic analysis of human movement using clinical tools as well as 2D and 3D video analysis to measure the geometry of joint and segmental motion during sport and pathological movements.
*ENS 631 – Kinetics of Human Movement (Graduate)*
Kinetic analysis of human movement using clinical tools and laboratory devices to measure the forces and torques applied to and by the body under normal and pathological conditions.

## PEER-REVIEWED RESEARCH

**Aguinaldo,** AL, and Chambers, HG. (submitted 2008). Effects of sequential body motion and method of delivery on elbow valgus load during baseball pitching. *American Journal of Sports Medicine*.

**Aguinaldo,** AL, Buttermore, J, and Chambers, HG. 2007. Effects of upper trunk rotation on shoulder joint torque between baseball pitchers of various levels. *Journal of Applied Biomechanics*, 23, 42-51.

**Aguinaldo,** AL, Clapper, M, Fithian, D, Paxton, L, Chambers, HG, and Sutherland, DH. 2006. Comparison by motion analysis of non-operative vs. operative treatment of Achilles Tendon ruptures. *Gait & Posture*, 24(S2), 228-230. (presented in part at the JEGM 2006, Amsterdam, Netherlands)

**Aguinaldo, AL,** Wyatt, MP, Sutherland, DH, Chambers, HG, 2004. Mechanical work performed on the body center of mass during walking in typical children and children with spastic diplegia. *Developmental Medicine and Child Neurology*, 46(S99): 23.

**Aguinaldo,** AL, and Mahar, AT, 2003. Impact loading in running shoes with cushioning column systems. *Journal of Applied Biomechanics,* 19(4), 353-360.

**Aguinaldo**, AL, Mahar, AT, Litavish, MJ, and Morales, AO. 2002. Ground reaction forces in running shoes with two types of cushioning column systems. In K.E. Gianikellis (Ed.), *Proceedings of the XXth International Symposium on Biomechanics in Sports, Caceres, Spain* (pp. 592-595).

**Aguinaldo,** AL, Litavish, MJ, and Morales, AO. 2002. Comparison of transient force attenuation between three types of heel cushions used in athletic footwear. *Gait & Posture*, 16(S1), 100-101.

**Aguinaldo**, AL and Quigley, E. 2001. Influence of an electronic prosthetic knee on the kinematics of transfemoral amputee gait. *Gait & Posture*, 13(3), 298-299.

## PRESENTATIONS AND LECTURES

Invited Speaker, “How Trunk Rotation and Arm Slot Affect Arm Torque during Pitching,” American Sports Medicine Institute Annual Injuries in Baseball Meeting, Houston, Texas, January 25, 2009.

Invited Lecturer, “A Comparison by Motion Analysis of ACL Reconstruction with a Patellar Tendon versus a Hamstring Tendon Autograft,” Visiting Professor, Rady Childrens Hospital San Diego, April 17, 2008.

Guest Lecturer, “An Introduction to Motion Analysis,” Statics and Dynamics undergraduate class, Department of Bioengineering, University of California, San Diego, CA, February 25, 2008

“Effects of sequential body motion on elbow valgus load during baseball pitching,” Major League Baseball Winter Meetings, Orlando, FL, December 3, 2006.

Invited Lecturer, “Distal Upper Extremity Kinematic Modeling,” Upper Extremity Symposium, Shriners Hospital for Children, Philadelphia, PA, July 21, 2006.

Visiting Professor, “Pitching Biomechanics,” Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD, April 1, 2005.

Visiting Professor, “Injury Implications in Overhand Throwing,” Chicago Memorial Medical Center, Chicago, IL, November 19, 2004.

“Accuracy of the functional method in locating the joint center of the abnormal hip,” *Nominated for Best Paper Award*, Gait and Clinical Movement Analysis Society Annual Meeting, Wilmington, DE, May 2003.

## FUNDING

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| Effects of Sequential Body Motion on Elbow Valgus Load during Baseball Pitching | $150,000 – Major League Baseball Medical Advisory Committee (2005-2008)<br>Role: Principal Investigator |
| A Comparison by Motion Analysis of ACL Reconstruction with a Patellar Tendon versus a Hamstring Tendon Autograft | $88,201 – Orthopedic Research & Education Foundation Grant (2003-2005)<br>Role: Research Coordinator; Designed protocol, organized budget, wrote and submitted proposal |
| Impact Forces and Rearfoot Motion During Running in Shoes with Integrated Cushioning and Motion Control Systems | $41,580 – Oakley, Inc. (2002-2003)<br>Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal |
| Impact Loading in Running Shoes with Cushioning Column Systems | $16,700 – LL International, LLC (2001-2002)<br>Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal |

## PROFESSIONAL ASSOCIATIONS

- Member - Editorial Board, Journal of Biomechanics (2004-)
- Member - Editorial Board, Gait & Posture (2003-2006)
- Member - National Athletic Trainers’ Association (2006-)
- Member - Communications Committee, Gait and Clinical Movement Analysis Society (2001-2002)
- Member - Whitaker Institute of Biomedical Engineering of UC San Diego (1998-2001)

## TECHNICAL SKILLS SUMMARY

- Over 8 years experience in installing, maintaining, and operating video and motion analysis, EMG, foot pressure, force platform, and energy consumption systems.
- Developed customized software for gait, running, pitching, and golf swing analysis.
- Data Analysis: power analysis, parametric statistics, regression analysis, SPSS, Excel
- Internet: web design (Dreamweaver), Google Tools (search, Scholar, Ads), PubMed