

AJIT MOHAN CHAUDHARI, PH.D.

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EDUCATION

- June 1997 to June 2003 **Stanford University**, Stanford, CA. Doctor of Philosophy in Mechanical Engineering.
- June 1996 to June 1997 **Stanford University**, Stanford, CA. Master of Science in Mechanical Engineering focusing in Smart Product Design.
- September 1992 to June 1996 **Stanford University**, Stanford, CA. Dual Bachelor of Sciences with Distinction in Biological Sciences and Mechanical Engineering.
- September 1982 to June 1991 **The Wellington School**, Upper Arlington, OH.

EMPLOYMENT

- October 2006 to present **Assistant Professor**, Department of Orthopaedics, Ohio State University.
- October 2006 to present **Director of Biomechanical Research**, Sports Medicine Center, Ohio State University.
- July 2003 to September 2006 **Research Associate**, Stanford Biomotion Laboratory, Stanford University Department of Mechanical Engineering.
- July 1998 to June 2003 **Graduate Research Fellow/Research Assistant**, Stanford Biomotion Laboratory, Stanford University Department of Mechanical Engineering.
- June 1997 to September 1997 **Research Assistant**, Stanford University Department of Aeronautics & Astronautics.
- June 1996 to September 1996 **Research Assistant**, Thermosciences Division, Stanford University Department of Mechanical Engineering.
- January 1995 to September 1995 **Research/Design Assistant**, Design Division, Stanford University Department of Mechanical Engineering.
- June 1994 to September 1994 **Research Assistant**, Stanford University Department of Biological Sciences.
- January 1994 to March 1994 **Intern**, United States Environmental Protection Agency, Washington, DC.

TEACHING & MENTORING EXPERIENCE

- September 2003 to September 2006 **Undergraduate Advisor**, Stanford University. Currently advising 14 undeclared undergraduate students who have interests in engineering.
- September 1998 to September 2006 **Mentor/Supervisor**, Stanford University. Assisted Prof. Andriacchi in supervising, advising, and consulting with undergraduate and graduate student members of the Stanford Biomotion Laboratory in conducting research and writing manuscripts.

- August 2001 to July 2004 **Assistant Cycling Coach**, Leukemia & Lymphoma Society's Team In Training, San Jose, CA. Trained several groups of novice cyclists in group riding skills, nutritional management, and physical/mental endurance for 100+ mile bicycle events.
- September 1997 to June 2002 **Project Coach**, Stanford University Department of Mechanical Engineering. Coached teams of students in the graduate Smart Product Design (mechatronics) class, ME218.
- September 1995 to June 1996 **Resident Math & Physics Tutor**, Stanford University. Provided drop-in tutoring in mathematics, physics, and engineering for residents of a 200+ student residence. Available several hours a day, seven days a week.

HONORS & AWARDS

- Graduation with Distinction – *Stanford University*, 1996.
 Member – *Phi Beta Kappa* national academic honor society, 1996.
 Member – *Tau Beta Pi* national engineering academic honor society, 1996.
 Recipient – Henry Fuchs Memorial Prize, *Stanford University Mechanical Engineering Department*, 1996.
 Recipient – James F. Lincoln Foundation National Design Award, *James F. Lincoln Arc Welding Foundation*, 1996.
 Recipient – Edgar N. Meakin Memorial Fellowship, *Stanford University Mechanical Engineering Department*, 1996.
 Recipient – National Defense Science and Engineering Graduate Fellowship, *United States Department of Defense*, 1997.
 Awardee – National Science Foundation Graduate Fellowship, *National Science Foundation*, 1997.
 Awardee – Whitaker Foundation Graduate Fellowship, *Whitaker Foundation*, 1997.
 Finalist – Amy J. Blue Award, *Stanford University*, 2004.
 Finalist – Shah Family Staff Award, *Stanford University*, 2004.

OTHER RESEARCH/ACADEMIC ACTIVITIES

- Invited speaker, International Society of Biomechanics XXth Congress & American Society of Biomechanics 29th Annual Meeting 2005
 Invited speaker, American College of Sports Medicine Annual Meeting 2005
 Guest lecturer, University of Michigan Division of Kinesiology
 Guest lecturer, Orthopaedics 222, Anatomy of Movement, Stanford University
 Guest lecturer, Henry Ford Hospital Bone & Joint Center
 Invited reviewer for Annals of Biomedical Engineering; Knee Surgery Sports Traumatology Arthroscopy; Journal of Biomechanics; Medicine & Science in Sports & Exercise; Journal of Bone & Joint Surgery; Journal of Science & Medicine in Sports; Journal of Biomechanical Engineering; Archives of Physical Medicine & Rehabilitation; Gait & Posture; American Society of Mechanical Engineers 2006 Summer Bioengineering Conference
 Invited commentator for Journal of Orthopaedic & Sports Physical Therapy
 Session Chairperson at American Society of Biomechanics 2003 Annual Meeting, American Society of Mechanical Engineers 2006 Summer Bioengineering Conference
 Member of American Society of Biomechanics (Active), Orthopaedic Research Society (Associate), American Society of Mechanical Engineers (Active)

PHD THESIS

- Chaudhari AM. *Development and Application of Biomechanical Methods to Study Non-Contact Injuries of the Anterior Cruciate Ligament*. Stanford University Department of Mechanical Engineering, June 2003.

PUBLICATIONS IN REFEREED JOURNALS

- Chaudhari AM**, Lindenfeld TN, Andriacchi TP, Hewett TE, Noyes FR. "Knee and Hip Loading Patterns at Different Phases in the Menstrual Cycle: Implications for the Gender Difference in ACL Injury Rates," *accepted for publication in American Journal of Sports Medicine*, September 2006.
- Shin CS, **Chaudhari AM**, Andriacchi TP. "The Influence of Deceleration Forces on ACL Strain during Single Leg Landing: A Simulation Study," *Journal of Biomechanics*, available online, June 2006.

- Corazza S, Mündermann L, **Chaudhari AM**, Demattio T, Cobelli C, Andriacchi TP. "A Markerless Motion Capture System to Study Musculoskeletal Biomechanics: Visual Hull and Simulated Annealing Approach," *Annals of Biomedical Engineering*, **34**(6): 903-1075, 2006.
- Chaudhari AM**, Andriacchi TP. "Effect of Fatigue on Knee Kinetics and Kinematics in Stop-Jump Tasks: Letter to the Editor," *American Journal of Sports Medicine*, **34**(2): 312, 2006.
- Chaudhari AM**, Andriacchi TP. "The Mechanical Consequences of Dynamic Frontal Plane Limb Alignment for Non-Contact ACL Injury," *Journal of Biomechanics*, **39**(2): 330-338, 2005.
- Chaudhari AM**, Hearn BK, Andriacchi TP. "Sport-Dependent Variations in Arm Position Influence Knee Loading: Implications for ACL Injury," *American Journal of Sports Medicine*, **33**(6): 824-830, 2005.
- Andriacchi TP, **Chaudhari AM**. "Self-Reported Giving-Way Episode During a Stepping-Down Task: Case Report of a Subject With an ACL-Deficient Knee: Invited Commentary," *Journal of Orthopaedic and Sports Physical Therapy*, **33**(5): 283-284, 2003.
- Fredericson M, Cookingham CL, **Chaudhari AM**, Dowdell BC, Oestreicher N, Sahrmann SA. "Hip Abductor Weakness in Distance Runners with Iliotibial Band Syndrome," *Clinical Journal of Sport Medicine*, **10**(3): 169-175, 2000.
- Chaudhari AM**, Woudenberg TM, Albin M, Goodson KE. "Transient Liquid Crystal Thermometry of Microfabricated PCR Vessel Arrays," *Journal of Microelectromechanical Systems (JMEMS)*, **7**: 345-355, 1998.

MANUSCRIPTS IN PREPARATION

- Chaudhari AM**, Dyrby CO, Andriacchi TP. "Anterior Tibial Translation is Not a Likely Mechanism of ACL Injury During Deceleration Tasks," *in preparation for Journal of Biomechanics*.
- Scanlan SF, **Chaudhari AM**, Dyrby CO, Andriacchi TP. "Compensatory Muscle Moments in ACL-Deficient Subjects Alter Knee Kinematics During Stair Ascent," *in preparation for Journal of Orthopaedic Research*.
- Shin CS, **Chaudhari AM**, Andriacchi TP. "The Influence of Valgus and Tibial Internal Rotation Loading on ACL Strain during Single Leg Landing," *in preparation for Journal of Biomechanics*.
- Shin CS, **Chaudhari AM**, Dyrby CO, Andriacchi TP. "Quadriceps Usage in ACL-Deficient Subjects is Influenced by Differences in Knee Extensor Anatomy," *in preparation for Journal of Orthopaedic Research*.

BOOK CHAPTERS

- Chaudhari AM**, Andriacchi TP. "Biomechanics and Gait," in *Orthopaedic Knowledge Update, 9th edition* (Fischgrund, ed.), 2006.
- Chaudhari AM**, Dyrby CO, Andriacchi TP. "The Importance of the ACL for the Function of The Knee: Relevance to Future Developments in Total Knee Arthroplasty," in *Total Knee Arthroplasty – A Guide to Get Better Performance* (Bellemans J, Ries M, Victor J, eds.), 2005, pp. 121-125.

INVITED CONFERENCE PRESENTATIONS

- Chaudhari AM**. "Knee Loading Patterns that Endanger the ACL: Insights from Experimental and Simulation Studies." *Invited Presentation for International Society of Biomechanics XXth Congress & American Society of Biomechanics 29th Annual Meeting*, Cleveland, OH, August 2005.
- Chaudhari AM**. "The Mechanical Consequences of Dynamic Hip Stiffness and Alignment for ACL Injury." *Invited Presentation for American College of Sports Medicine 52nd Annual Meeting*, Nashville, TN, June 2005.

PEER-REVIEWED CONFERENCE PRESENTATIONS AND POSTERS

- Corazza S, Mündermann L, **Chaudhari AM**, Andriacchi TP. "A Framework for the Functional Identification of Joint Centers Using Markerless Motion Capture, Validation for the Hip Joint." *American Society of Biomechanics 30th Annual Meeting*, Blacksburg, VA, September 2006.
- Mündermann L, Mündermann A, Corazza S, **Chaudhari AM**, Andriacchi TP. "Phasing of Trunk Motion Is Critical for the Efficacy of Gait Retraining Aimed to Reduce Knee Loads." *American Society of Biomechanics 30th Annual Meeting*, Blacksburg, VA, September 2006.
- Shin CS, **Chaudhari AM**, Dyrby CO, Andriacchi TP. "Large Patellar Ligament Insertion Angle Following ACL Injury Causes Large Quadriceps Reduction During Walking." *American Society of Biomechanics 30th Annual Meeting*, Blacksburg, VA, September 2006.
- Chaudhari AM**, Koo S, Scanlan SF, Andriacchi TP. "ACL Graft Sagittal Plane Orientation Influences Anterior-Posterior Translation During Walking." *2006 ASME Summer Bioengineering Conference*, Amelia Island, FL, June 2006.
- Chaudhari AM**, Scanlan SF, Andriacchi TP. "ACL Reconstruction Does Not Fully Restore Knee Kinematics During Walking." *2006 ASME Summer Bioengineering Conference*, Amelia Island, FL, June 2006.
- Shin CS, **Chaudhari AM**, Andriacchi TP. "The Effect of Lateral Tibial Tunnel Movement of Single Bundle ACL Reconstruction & The Effect of Double Bundle Reconstruction on the Internal Rotation During Dynamic Single-Leg Landing." *2006 ASME Summer Bioengineering Conference*, Amelia Island, FL, June 2006.
- Chaudhari AM**, Dyrby CO, D'Lima DD, Colwell CW, Andriacchi TP. "A Direct Test of the Relationship Between Medial Compartment Load and the Knee Adduction Moment Using an Instrumented Knee." *Transactions of the 52nd Annual Meeting of the Orthopaedic Research Society*, Chicago, IL, March 2006.
- Scanlan SF, **Chaudhari AM**, Dyrby CO, Andriacchi TP. "Compensatory Muscle Moments in ACL-Deficient Subjects Reduce Anterior Tibial Translation During Stair Ascent." *Transactions of the 52nd Annual Meeting of the Orthopaedic Research Society*, Chicago, IL, March 2006.
- Mündermann L, Mündermann A, Corazza S, Lin T, **Chaudhari AM**, Andriacchi TP. "Gait Retraining to Reduce Medial Compartment Load at the Knee Assessed Using Markerless Motion Capture." *Transactions of the 52nd Annual Meeting of the Orthopaedic Research Society*, Chicago, IL, March 2006.
- Shin CS, **Chaudhari AM**, Dyrby CO, Andriacchi TP. "Influences of Patellar Ligament Insertion Angle on Quadriceps Usage During Walking: Effect of an Anterior Cruciate Ligament Deficit." *International Symposium on Ligaments & Tendons VI*, Chicago, IL, March 2006.
- Mündermann L, Corazza S, **Chaudhari AM**, Andriacchi TP, Sundaresan A, Chellappa R. "Measuring Human Movement for Biomechanical Applications Using Markerless Motion Capture." *IS&T/SPIE 18th Annual Symposium on Electronic Imaging Science and Technology*, San Jose, CA, January 2006.
- Chaudhari AM**, Shin CS, Dyrby CO, Andriacchi TP. "Patellar Ligament Insertion Angle Influences Quadriceps Use During Stair Climbing: Effect of an ACL Deficit." *International Society of Biomechanics XXth Congress & American Society of Biomechanics 29th Annual Meeting*, Cleveland, OH, August 2005.
- Shin CS, **Chaudhari AM**, Andriacchi TP. "Combined Valgus and Internal Rotation Moments Strain the ACL More Than Either Alone: Implications for Non-Contact ACL Injuries." *International Society of Biomechanics XXth Congress & American Society of Biomechanics 29th Annual Meeting*, Cleveland, OH, August 2005.
- Shin CS, **Chaudhari AM**, Andriacchi TP. "Valgus Moments Increase ACL Strain in a Simulation Model: Implications for Gender Differences in ACL Injury." *Proceedings of the 2005 ASME Summer Bioengineering Conference*, Vail, CO, June 2005.
- Chaudhari AM**, Shin CS, Andriacchi TP, Withrow TJ, Ashton-Miller JA, Wojtys EM, Huston LJ. "ACL Strains are Influenced by Deceleration Forces During Activities Associated with ACL Injury." *Transactions of the 51st Annual Meeting of the Orthopaedic Research Society*, Washington, DC, February 2005.

- Mündermann L, Mündermann A, **Chaudhari AM**, Andriacchi TP. "Accuracy of Anthropometric Parameter Estimation for Human Body Segments Using 3D Shape-From-Silhouette Reconstruction with Multiple Cameras." *IS&T/SPIE 17th Annual Symposium on Electronic Imaging Science and Technology*, San Jose, CA, January 2005.
- Mündermann L, Corrazza S, **Chaudhari AM**, Alexander EJ, Andriacchi TP. "Optimal Camera Configuration for a Shape-From-Silhouette Markerless Motion Capture System for Biomechanical Analysis." *IS&T/SPIE 17th Annual Symposium on Electronic Imaging Science and Technology*, San Jose, CA, January 2005.
- Nagura T, Matsumoto H, **Chaudhari AM**, Andriacchi TP. "Significance of the Extensor Muscle Force in Deep Knee Flexion as Part of Activities of Daily Living." *Transactions of the 51st Annual Meeting of the Orthopaedic Research Society*, Washington, DC, February 2005.
- Mündermann L, **Chaudhari AM**, Alexander EJ, Andriacchi TP. "Estimation of the Accuracy of a Shape-From-Silhouette Markerless Motion Capture System." *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics*, Portland OR, September 2004.
- Shin CS, Dyrby CO, Hearn BK, **Chaudhari AM**, Andriacchi TP. "Anterior Cruciate Ligament Injury and Patellar Ligament Insertion Angle." *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics*, Portland OR, September 2004.
- Chaudhari AM**, Dyrby CO, Andriacchi TP. "Kinematic Factors Associated With Risk of Non-Contact ACL Injuries During Single-Limb Landing." *Proceedings of the 50th Annual Meeting of the Orthopaedic Research Society*. San Francisco CA, March 2004.
- Chaudhari AM**, Dyrby CO, Andriacchi TP. "Anterior Tibial Translation Is Not a Likely Mechanism of Anterior Cruciate Ligament Injury During Non-Contact Sports Situations." *International Symposium on Ligaments & Tendons – IV*, San Francisco CA, March 2004.
- Chaudhari AM**, Marquand AA, Hearn BK, Leveille LA, Johnson ER, Andriacchi TP. "Sport-Dependent Variations in Arm Position During Single Limb Landing Affect Knee Loading: Implications for ACL Injury," *Proceedings of the 27th Annual Meeting of the American Society of Biomechanics*, Toledo OH, September 2003.
- Chaudhari AM**, Hearn BK, Leveille LA, Johnson ER, Andriacchi TP. "The Effects of Dynamic Limb Alignment on Knee Moments During Single Limb Landing: Implications for the Analysis of the Non-Contact Injury to the Anterior Cruciate Ligament," *2003 ASME Summer Bioengineering Conference*, Miami FL, June 2003.
- Chaudhari AM**, Hearn BK, Leveille LA, Andriacchi TP. "The Mechanical Consequences of Gender Differences in Single Limb Alignment During Landing," *ACL Injuries—The Gender Bias: Research Retreat II*, Lexington KY, April 2003.
- Chaudhari AM**, Hearn BK, Leveille LA, Andriacchi TP. "The Mechanical Consequences of Gender Differences in Single Limb Alignment During Landing," *International Symposium on Ligaments & Tendons – III*, New Orleans LA, February 2003.
- Chaudhari AM**, Dyrby CO, Hearn BK, Andriacchi TP. "Dynamic Changes in Anterior/Posterior Translation and Internal/External Rotation of the Knee During Cycling," *Proceedings of the 25th Annual Meeting of the American Society of Biomechanics*, San Diego CA, August 2001.
- Chaudhari AM**, Bragg RW, Alexander EJ, Andriacchi TP. "A Video-Based, Markerless Motion Tracking System for Biomechanical Analysis in an Arbitrary Environment," *ASME 2001 Summer Bioengineering Conference*, Snowbird UT, June 2001.
- MacMahon JM, **Chaudhari AM**, Andriacchi TP. "Injury Incidence, Distribution, and Severity During a Marathon Training Season – The Implications," *XIX International Symposium on Biomechanics in Sports*, San Francisco, June 2001.
- MacMahon JM, **Chaudhari AM**, Zenorini CA, Fischer JS, Bragg RW. "A Prospective Study of Keirsey Temperaments and Injuries Amongst Runners Training for a Marathon," *American Association for the Advancement of Sport Psychology*, Nashville TN, September 2000.

- MacMahon, JM, **Chaudhari AM**, Andriacchi TP. "A Prospective Study of Iliotibial Band Flexibility and Abductor Strength – Implications for Marathon Training Success," *24th Annual Meeting of the American Society of Biomechanics*, Chicago IL: 179-80, July 2000.
- Nagura T, Dyrby CO, **Chaudhari AM**, MacMahon JM, Alexander EJ, Andriacchi TP. "Evaluation of Dynamic Joint Loading During Rising and Descending to a Kneeling Position," *24th Annual Meeting of the American Society of Biomechanics*, Chicago IL: 123-4, July 2000.
- MacMahon JM, **Chaudhari AM**, Andriacchi TP. "Biomechanical Injury Predictors for Marathon Runners: Striding Towards Iliotibial Band Syndrome Injury Prevention," *XVIII International Symposium on Biomechanics in Sports*, Hong Kong, June 2000.