ARNEL AGUINALDO, PH.D., ATC

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SUMMARY

Biomechanics professor and engineer with over 16 years of teaching, research, and clinical experience in the fields of gait analysis, kinesiology, athletic training, and bioengineering.

EDUCATION

Ph.D., Health and Human Performance, Concordia University Chicago
Dissertation: Relative contributions of segmental energy in elbow valgus loading during baseball pitching

M.A., Physical Education (Biomechanics & Athletic Training)**,** San Diego State University
Thesis: Joint center of pressure with valgus bracing for knee osteoarthritis using a mechanical knee surrogate

B.S., Bioengineering, University of California, San Diego

CERTIFICATIONS

Certified Athletic Trainer (ATC) – NATA Board of Certification #060002343
Basic Life Support (BLS) – American Heart Association

PROFESSIONAL EXPERIENCE

Point Loma Nazarene University, San Diego, CA

Director, PLNU Padres Biomechanics Laboratory *October 2023 - present*
Associate Professor *August 2021 - present*
Assistant Professor *August 2018 – June 2021*
Part-Time Professor *August 2015 – June 2018*
Adjunct Professor *August 2013 – June 2015*
Department of Kinesiology

- Teach a variety of undergraduate and graduate courses in the Department of Kinesiology.
- Mentor students in the Sports Performance concentration of the M.S. Kinesiology program.
- Direct biomechanics research for the students and faculty of the Department of Kinesiology.
- Design and maintain all aspects of motion analysis, electromyography, force plate, and ball tracking systems in the PLNU X Padres Biomechanics Laboratory
- Advise students on undergraduate and graduate student led research in kinesiology and biomechanics.

Motion Analysis Corporation, Santa Rosa, CA

Vice President of Applications Engineering *Dec 2015 – June 2019*
Movement Analysis Sciences

- Led development team in the design and testing of motion capture specific applications aimed at providing solutions using cutting edge 3D motion capture technology for gait analysis, running analysis, baseball pitching, baseball hitting, golf, footwear, and low back assessment.
- Provide expert information for biomechanical applications of system and software solutions.

Biomechanics Engineer *January 2013 – December 2015*
Movement Analysis Sciences

- Served as lead biomechanics support engineer in human movement analysis for global company specializing in passive optical motion capture and analysis.
- Provided technical and expert consultation support to users in hospitals and universities on hardware and software methods used in biomechanics and gait analysis practice and research both remotely (San Diego) and on-site.

San Diego State University, San Diego, CA

Adjunct Professor *August 2005 – June 2015*
School of Exercise and Nutritional Sciences

- Taught various undergraduate and graduate level classes in the School of Exercise and Nutritional Sciences. Courses include biomechanics of human movement, functional human movement, biomechanical measurement techniques, and measurement and evaluation in exercise science.

California State University - San Marcos, San Marcos, CA

Adjunct Professor *Jan 2012 – December 2013*
Department of Kinesiology

- Taught 3 sections of Measurement and Evaluation in Kinesiology course.

Rady Children's Hospital, San Diego, CA

Director *June 2004 – June 2015*
Motion Analysis Laboratory

- Developed and directed the Center for Human Performance (CHP) in utilizing motion analysis to evaluate sports performance for enhancement and injury prevention.
- Established research and service-based programs in sports medicine and athletic training. Actively pursued and obtained funding from private entities and industry to support ongoing research in sports medicine, footwear biomechanics, and clinical gait analysis.
- Presented research through journal publications and talks at scientific conferences.
- Created kinematic model for measuring upper-extremity motion used for the analysis of baseball pitching and the golf swing.
- Managed orthopedic biomechanics research facility that focused on in-vitro and pre-clinical orthopedic research, specifically in biomechanics of surgical procedures and instrumentation using engineering techniques.
- Supervised projects related to the materials testing of spinal instrumentation, fracture fixation techniques, casting, ACL repair techniques, and materials on cadaveric and benchtop models.

Bioengineer *March 2000 – June 2004*
Motion Analysis Laboratory

- 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.
- Developed biomechanical software for kinematics, 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.

TEACHING EXPERIENCE

Point Loma Nazarene University - Department of Kinesiology

ATR 605 – Research Methods and Statistical Techniques in Sports Medicine (Graduate)
Designed and currently teach a course that explores the variety in research design and statistics commonly used in clinical research and decision making in sports medicine. Students develop analytical skills needed to support professional evidence-based practice in athletic training. Students evaluate the merit and relevance of published research to the practice of athletic training from the perspective of experimental methodology and design.

KIN 327 – Applied Biomechanics
Designed and currently teach an introductory course on the biomechanics of human movement. It aims to provide students with a mix of theoretical concepts and applied problem-solving in various biomechanical applications in human movement. Topics include Newtonian mechanics, kinematic measurement, ground reaction forces, kinetics, gait analysis, and jump analysis.

KIN 327L – Biomechanics Laboratory
Introductory lab-based course designed to provide students with hands-on experience in measuring and analyzing kinematic, kinetic, and muscle activation data of human movement tasks such as walking, running, jumping, throwing, and functional movement screen.

KIN 440 – Measurement, Statistics, and Evaluation of Human Performance (Hybrid)
Designed and currently teach a course to introduce students to measurement techniques and instruments, descriptive and inferential statistics and evaluation procedures used in human performance. Topics include techniques of construction, organization, administration, and interpretation involved in human performance research. The course emphasizes critical evaluation of data using basic statistical techniques and an evaluation of research design in human performance- related studies.

KIN 605 – Research Methods (Graduate)
Designed and currently teach an introductory course on general research principles. The course provides an introduction to analyzing data and designing research experiments in exercise and sport science. Topics include: 1) selected techniques and designs used in research, with special emphasis given to planning, conducting, and reporting of research; 2) applied statistical analysis and interpretation of data from the field of exercise and sport science; and 3) ethical issues in scientific research.

KIN 615 – Biomechanical and Neurological Basis of Human Movement (Graduate)
Designed and currently teach a course on various kinematic, kinetic, and neuromuscular concepts and how they are used in the qualitative and quantitative analysis of human movement. It is designed for advanced study in 3D motion analysis and electromyography techniques. The intent of this course is to provide students with an extensive knowledge concerning quantitative analysis of human motion and the concepts and equipment to collect objective quantifiable data to be used for clinical or research purposes.

KIN 650 – Seminar in Kinesiology (Graduate)
Designed and implemented a course to assist masters-level students in the research process to deepen knowledge in an area of their professional interest. Students are expected to complete and present an original research project including preliminary statistical design, data collection, data analysis, and presentation of results at a department-wide poster session.

KIN 660 – Directed Readings (Graduate)

Designed and implemented a course to provide advanced study in the essential research of a specific discipline in Kinesiology. The course aims to provide students with the fundamental skills in reading and evaluating research, including examining research paradigms, critically appraising study design and findings, and determining the practical relevance of the results.

KIN 699 – Thesis (Graduate)
Act as committee chair and guide students throughout their thesis projects. Emphasis is placed on design, IRB, subject recruitment, data collection, analysis, interpretation, and presentation of results. Students are required to defend their thesis in front of their committee and peers at the end of the MS Kinesiology program.

San Diego State University - School of Exercise and Nutritional Sciences

ENS 305 – Measurement and Evaluation in Kinesiology
Designed and currently teach a course to introduce students to measurement techniques and instruments, parametric statistics, and evaluation procedures used in the assessment of physical activity and human performance. Principles and techniques of organization, administration, and interpretation involved in human performance research. Includes critical evaluation of data using basic statistical techniques and an evaluation of research design in human performance- related studies.

ENS 306 – Biomechanics of Human Movement
This class was designed to provide students with a mix of theoretical concepts and applied problem-solving in various biomechanical applications in human movement. Emphasis was placed on the basic concepts of kinematics and kinetics of whole body and joint movement.

ENS 436 – Functional Human Movement
Advanced course on the biomechanics and pathomechanics of human movement with emphasis on scientific literature to support theories of movement dysfunction. Focus was placed on gait and functional human movement, from an evidence-based perspective, to support rehabilitation processes.

ENS 603 – Measurement and Evaluation in Exercise Science (Graduate)
This course aimed to provide students a comprehensive examination of measurement theory and practice as applied to exercise and rehabilitation sciences. Topics included an overview of basic measurement concepts and specific topics in clinical and research settings relevant to exercise and rehabilitation contexts and was designed to assist students in making accurate interpretations of data.

ENS 610 – Biomechanical Measurement Techniques I (Graduate)
This course involved the study of 2D and 3D biomechanics with emphasis on theoretical and practical approaches in measuring and evaluating kinematics of human movement.

ENS 611 – Biomechanical Measurement Techniques II (Graduate)
This course involved the study of 2D and 3D biomechanics with emphasis on theoretical and practical approaches in measuring and evaluating kinematics and kinetics of human movement. Focus was placed on reliably collecting motion capture and force platform data to perform a kinematic and kinetic evaluation of various forms of human movement.

ENS 612 – Biomechanical Measurement Techniques III (Graduate)
The course aimed to provide students a comprehensive examination of the interaction between the neuromuscular system and the biomechanics of human movement. The course focused on the study of neurological function and muscular performance with emphasis on electromyographic analysis of normal and pathological human movement using theoretical concepts and empirical evidence reported in the scientific literature.

California State University - San Marcos - Department of Kinesiology

KINE 403 – Measurement and Evaluation in Kinesiology
Introductory course on measurement and evaluation that provides students with the principles and techniques of construction, organization, administration, interpretation and evaluation of measuring devices used in kinesiology. The course included critical evaluation of data using basic statistical techniques and an evaluation of research design in kinesiology-related studies.

PEER-REVIEWED RESEARCH

Hashimoto J, La Salle, DT, Takata, A, **Aguinaldo, AL**, Wasserberger, K. (2023). Energy flow and ground reaction force predictors of bat swing speed during pitched ball batting in professional baseball players, *ISBS Proceedings Archive,* 41(1), 45.

Aguinaldo, AL, Nicholson, K. (2022). Pelvis energy flow and ground reaction force predictors of elbow torque in high school and collegiate baseball pitchers, *ISBS Proceedings Archive*, 40(1)*,* 13.

Friesen, KB, **Aguinaldo, AL**, & Oliver, GD. (2022). Athlete body composition influences movement during sporting tasks: an analysis of softball pitchers' joint angular velocities. *Sports Biomechanics*, 1-14.

Nicholson, KF, Hulburt, TC, Kimura, BM, & **Aguinaldo, AL.** (2021). Relationship between ground reaction force and throwing arm kinetics in high school and collegiate pitchers. *Journal of Sports Medicine and Physical Fitness.* https://doi.org/10.23736/s0022-4707.21.13150-0

Aguinaldo, AL, Nicholson, K (2021). Lower body contributions to pelvis energy flow and pitch velocity in collegiate baseball players, *ISBS Proceedings Archive*, 39(1), 36.

Alderink, GJ, Kepple, T, Stanhope, SJ, & **Aguinaldo, AL.** (2021). Upper body contributions to pitched ball velocity in elite high school pitchers using an induced velocity analysis. *Journal of Biomechanics*, *120*. doi:10.1016/j.jbiomech.2021.110360

Aguinaldo, AL, Nicholson, K, Alderink, G and Kepple, T. (2020). Multi-segment contributions to induced ball velocity in collegiate baseball players, *ISBS Proceedings Archive,* 38(1), 199.

Sterner, JA, Reaves, SK, **Aguinaldo, AL,** Hazelwood, SJ, & Klisch, SM. (2020). Inverse dynamics analysis of youth pitching arm kinetics using body composition imaging. *Sports Biomechanics*, 1–15. doi:10.1080/14763141.2020.1715470

Aguinaldo, AL, and Escamilla, RF. (2020). Induced power analysis of sequential body motion and elbow valgus load during baseball pitching. *Sports Biomechanics*, 1–13. 10.1080/14763141.2019.1696881

Dexheimer, J, Schroeder, TE, Sawyer, B, Pettitt, R, **Aguinaldo, AL**, & Torrence, WA. (2019). Physiological Performance Measures as Indicators of CrossFit ® Performance. *Sports, 7*(93), 1–13. doi:10.3390/sports7040093

Aguinaldo, AL, and Escamilla, RF. (2019). Segmental power analysis of sequential body motion and elbow valgus load during baseball pitching: Comparison between professional and high school baseball players. *Orthopedic Journal of Sports Medicine,* 7(2), 232596711982792.

Aguinaldo, AL, and Escamilla, RF. (2018). Relationship of segmental energy flow and elbow valgus load during baseball pitching. *ISBS Proceedings Archive,* 36(1), 911-914.

Darke, JD, Dandekar, EM, **Aguinaldo, AL**, Hazelwood, SJ, Klisch, SM. (2018). Analysis of Game Pitch Count and Body Mass Index as Injury Risk Factors for Youth Baseball Pitchers. *Orthopedic Journal of Sports Medicine*, 6(4), 232596711876565.

Zamporri, J., and **Aguinaldo, AL**. (2018). The effects of compression tights on dynamic knee motion during a drop vertical jump in female college athletes. *Orthopedic Journal of Sports Medicine*, 6(8), 2325967118789955.

Slenker, NR, Limpisvasti, O, Mohr, K, **Aguinaldo, AL**, ElAttrache, NS. (2014). Biomechanical comparison of the interval throwing progression and baseball pitching: Upper extremity stresses in training and rehabilitation. *American Journal of Sports Medicine*, 42(5), 1226-32.

Luker, KR, **Aguinaldo, AL**, Kenney, D, Cahill-Rowley, K, Ladd, AL. (2014). Functional task kinematics of the thumb carpometacarpal joint. *Clinical Orthopedics and Related Research*, 472(4), 1123-9.

Unfried, B, **Aguinaldo**, AL, Cipriani, D. (2013). What is the Influence of Cambered Running Surface on Lower Extremity Muscle Activity? *Journal of Applied Biomechanics*, 29(4), 421-7.

Aguinaldo, AL, and Chambers, HG. (2009). Correlation of throwing mechanics with elbow valgus load in adult baseball pitchers. *American Journal of Sports Medicine,* 37(10), 2043-2048.

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, Wyatt, MP, Chambers, HG, Sutherland, DH. (2003). Accuracy of the functional method in locating the joint center of the abnormal hip. In: *Proceedings of the Eighth Gait and Clinical Movement Analysis Meeting*. University of Delaware (Nominated for Best Paper Award)

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

Keynote Speaker, “Concurrent validity of in-lab markerless motion capture in estimating pitching-related kinematics,” Qualisys User Group Meeting, Meyer Institute of Sport, Los Angeles, CA, November 4, 2023

Invited Lecturer, “Inverse Dynamics,” Department of Mechanical Engineering, San Diego State University, October 10, 2023.

Poster Presenter, “Differences in the energy flow, ground reaction force, and impulse during baseball tee batting between high school and collegiate baseball players,” International Society of Biomechanics in Sports Meeting, Milwaukee, WI, July 13, 2023.

Poster Presenter, “Relationship Between Athlete Performance Metrics and Pelvis Energy Flow in Adult Baseball Pitchers,” American College of Sports Medicine Meeting, Denver, CO, May 21, 2023.

Keynote Speaker, “Predicting Hitting Power Using Energy Flow Analysis in High School, Collegiate, and Professional Baseball Players," Society for American Baseball Research Meeting, Phoenix, AZ, March 11, 2023.

Invited Lecturer, “A primer for energy flow analyses in throwing and hitting,” International Society of Biomechanics in Sports Mid-Year Symposium, February 8, 2023.

Poster Presenter, “Equivalence and reliability of baseball pitching kinematics using markerless and marker-based motion capture,” North American Congress of Biomechanics, Ottawa, Canada, August 24, 2022.

Podium Presenter, “Pelvis energy flow and ground reaction force predictors of elbow torque in high school and collegiate baseball pitchers,” International Society of Biomechanics in Sports Meeting, Liverpool, UK, July 22, 2022

Podium Presenter, “Lower body contributions to pelvis energy flow and pitch velocity in collegiate baseball players,” International Society of Biomechanics in Sports Meeting, Canberra, Australia, September 5, 2021.

Podium Presenter, “Multi-segment components of induced power generation during pitching in collegiate baseball players,” International Society of Biomechanics Virtual Conference, July 28, 2021.

Poster Presenter, “Influence of Back Foot Orientation on Kinetics and Kinematics during Baseball Pitching,” American College of Sports Medicine Virtual Experience, June 3, 2021

Panelist, “Energy flow analysis of baseball pitching,” International Society of Biomechanics in Sports Virtual Symposium, February 5, 2021.

Invited Lecturer, “Mechanical energy of baseball pitching: Implications for Shoulder and Elbow Injuries,” World Pitching Congress, January 16, 2021.

Poster Presenter, “Multi-segment contributions to induced ball velocity and power in collegiate baseball pitchers,” American Society of Biomechanics Virtual Conference, August 6, 2020.

Poster Presenter, “A Comparison of Pitch Velocity and Elbow Valgus Torque between Collegiate Baseball Pitchers Trained with and without Weighted-ball Exercises,” American College of Sports Medicine Virtual Experience, June 17, 2020.

Invited Lecturer, “Biomechanical Basis of Baseball-Related Injuries,” San Diego Padres, March 20, 2020.

Podium Presenter, “Induced power analysis of elbow valgus loading during baseball pitching,” International Society of Biomechanics Meeting, Calgary, Alberta, August 7, 2019.

Poster Presenter, “Induced power analysis of elbow valgus loading during baseball pitching,” American College of Sports Medicine Meeting, Orlando, FL, May 31, 2019.

Invited Lecturer, “Elbow Biomechanics and Rehab of the Overhead Throwing Athlete,” American Physical Therapy Association Combined Sections Meeting, Washington, DC, January 24, 2019.

Podium Presenter, “Relationship of segmental energy flow and elbow valgus load during baseball pitching,” American Society of Biomechanics Meeting, Rochester, MN, August 10, 2018.

Podium Presenter, “Segmental power analysis of elbow valgus load during baseball pitching,” World Congress of Biomechanics Meeting, Dublin, Ireland, July 10, 2018.

Invited Lecturer, “Biomechanical Implications of Injury Prevention and Performance in Baseball,” MAC3D Seminar, NAC Image Technology, Tokyo, Japan, October 6, 2017.

Podium Presenter, “The effects of compression tights on dynamic knee motion during a drop vertical jump in female college athletes,” International Society of Biomechanics in Sports Meeting, Cologne, Germany, June 18, 2017.

Invited Lecturer, “Elbow Pitching Biomechanics and UCL Injury Risk Factors in Adult and Youth Pitchers,” American Physical Therapy Association Combined Sections Meeting, Indianapolis, IN, February 5, 2015

Guest Lecturer, “An Introduction to Motion Analysis,” Statics and Dynamics undergraduate class, Department of Bioengineering, University of California, San Diego, CA, February 16, 2012

Invited Speaker, “Clinical Gait Analysis,” Grand Rounds, Department of Orthopedics, University of California San Diego Medical Center, San Diego, CA, September 14, 2011.

Keynote Speaker, “Sports Biomechanics and Motion Analysis,” Educational Dinner Symposium, National Association of Orthopedic Nurses, San Diego, CA, September 8, 2010.

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.

Invited Lecturer, “Upper Extremity Kinematics,” Upper Body Symposium, Gait and Clinical Movement Analysis Society Annual Meeting, Lexington, KY, May 2004.

“Functional Gait Limitations and Treatment of the Knee in Patients with Cerebral Palsy: Knee Biomechanics,” American Academy of Cerebral Palsy and Developmental Medicine

- 56th Annual Meeting, New Orleans, LA, September, 2002
- 54th Annual Meeting, Toronto, Canada, September, 2000.

STUDENT MENTORSHIPS

Doctoral Students: Committee Member

- **Bart van Trigt** (2023)**.** Keep the pitcher’s elbow load in the game. Opposition Member, Delft University of Technology, The Netherlands

- **Tessa Hulburt** (2020-2022). Simulated muscle contributions to elbow valgus loading during baseball pitching in collegiate players. Committee Member, Wake Forest University, North Carolina.

Masters Students: Chair, Point Loma Nazarene University

- **Stefanie Vidaurri** (2022-2023): Use of the *ArmCare* Device in Measuring Strength and Range of Motion in Collegiate Baseball Pitchers.

- **Tyler Cardinale** (2022-2023): Concurrent validity and reliability of in-lab markerless motion capture in estimating joint kinematics in baseball pitching.

- **Jessy Capua** (2022-2023): Biomechanical effects of graded running with carbon-fiber plated shoes.

- **Baxter Halligan** (2022-2023): Impact of arm path on joint kinetics and pitch velocity.

- **Jason Hashimoto** (2022-2023). Energy flow and ground reaction force predictors of bat swing speed during pitched ball batting in professional baseball players.

- **Caleigh Nelson** (2021-2022). Effects of an 8-week Pilates Training Program on Hip Biomechanics and Countermovement Jump Performance in Adult Female Ballet Dancers.

- **Joshua Schneider** (2021-2022). Differences in the Energy Flow, Ground Reaction Force, and Impulse during Baseball Tee Batting between High School and Collegiate Baseball Players.

- **Taylor Bright** (2020-2021). Comparing Depression, Anxiety, and Stress in Male vs. Female Collegiate Student Athletes during the COVID-19 Pandemic

- **Tina Stefanovic** (2020-2021). Ball Speed Predictors in One-Legged Attacks in Female Volleyball Players
- **Avery Avina** (2020-2021). Predicting Bat Speed with Energy Flow and Kinematic Variables in Collegiate Tee-Batting.
- **Madison Harding** (2019-2021). Biomechanical comparison of running in shoes with and without carbon-plated midsoles.
- **Rebecca Bonaker** (2019-2020). Influence of back foot orientation on kinetics and kinematics during baseball pitching.
- **Julia Semmler** (2019-2020). The effect of neuromuscular training compared to traditional training in decreasing knee valgus torque during cutting in male athletes: A critically appraised topic.
- **Bryce Willian** (2019-2020). Jumping performance in weighted vs. unweighted ropes in adolescent volleyball players: A critically appraised topic
- **Reagan Buckner** (2018-2019). Increased valgus loading during block landings in female volleyball players: A critically appraised topic.
- **Estevan Gomez** (2018-2019). A comparison of pitch velocity and elbow valgus torque between collegiate baseball pitchers trained with and without weighted-ball exercises.
- **Gretchen Hoffman** (2018-2019). Effects of a 6-week balance training program on throwing velocity and joint kinetics in collegiate baseball pitchers.
- **Eric Burger** (2017-2018). Validation of a wearable sensor in the estimation of elbow valgus torque during baseball pitching.
- **Amy Ogren** (2017-2018). The effect of neuromuscular training warm-up on female collegiate athletes during the side-step cutting maneuver.
- **Jesus Ramos** (2017-2018). The effects of ankle based neuromuscular training on landing knee valgus in post pubescent female athletes.
- **Tanya Djafar** (2016-2017). Potential biomechanical effects of footstrike patterns in runners with amputation.
- **Sydney Dreves** (2016-2017). Long term effects of a wearable neuromuscular device on modifiable risk factors associated with ACL injuries in female athletes during a countermovement jump.
- **Caitlin Mazurek** (2016-2017). Individual cross punch versus combination cross punch mechanics.
- **Bradley Dobson** (2015-2016). The effect trunk rotation timing has on maximal shoulder joint and elbow torque in elite baseball pitchers.
- **Jay Zamporri** (2015-2016). The effects of compression tights on dynamic knee motion during a drop vertical jump in female college athletes.

Masters Students: Committee Member, San Diego State University

- **Birgit Unfried** (2009-2011). The influence of cambered running surface on lower extremity muscle activity.

- **Michelle Haines** (2008-2010). Sagittal plane biomechanics during side-step cutting in female athletes.

Honors Scholars: Mentor, Point Loma Nazarene University

- **Madelyn Henning** (2022-2023): Kinematics and Kinetics of Sumo versus Conventional Deadlift.

- **Emily Delmont** (2022-2023): The Role of Clinical Gait Analysis in Treatment Decision Making in Children with Ambulatory Cerebral Palsy: A Critically Appraised Topic

- **Julianna Suel** (2021-2022): Biomechanical differences between a grand plie and a changement in female ballet dancers.

- **Avery Avina** (2019-2020). Effects of pelvic rotation, trunk rotation, and ground reaction forces on bat speed in collegiate baseball hitters.

- **Ian Laventure** (2019-2020). An exploratory analysis of force production characteristics and offensive performance variables in NCAA DII collegiate baseball players.

- **Madelyn Dow** (2018-2019). Concurrent validity and reliability of mobile applications in measuring vertical jump performance.

FUNDING

Kinematics and kinetics during gait on a Computer Assisted Rehabilitation Environment (CAREN)	$35,000 – U.S. Department of Defense (2010-2012) Role: Government Contract Award Recipient
Motion Analysis of the Easy Spirit Anti-Gravity Walking Shoe	$19,000 – Jones Apparel Group (2010) Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal
Comparative Analysis of Toning Shoes on Walking Kinematics and Kinetics	$60,000 – ACI International (2009-2010) Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal
Effects of Sequential Body Motion on Elbow Valgus Load during Baseball Pitching	$150,000 – Major League Baseball Medical Advisory Committee (2005-2008) Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal
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) 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) 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) Role: Principal Investigator; Designed protocol, organized budget, wrote and submitted proposal

SERVICE

Departmental (Kinesiology, Point Loma Nazarene University)
- Student Advisor – Applied Health Science (2018-present)
- Member - Assessment Committee (2018-present)
- Mentor - Honors Scholars Program (2018-2020)
- Research Advisor - MS-Kinesiology student research (2015-present)

University (Point Loma Nazarene University)
- Name Reader – Commencement (2023-present)
- Member - Intercollegiate Athletics Committee (2020-2021)
- Honor Guard - Commencement (2017-2020)

Community (San Diego County)
- Volunteer - Community Through Hope food distribution (2020-present)
- Volunteer/Donor - Feeding San Diego (2016-present)
- Child Sponsor - *Compassion International* (2018-present)
- Volunteer - "I Love CV" clean-up projects (2018-present)
- Group Leader - *Hand Over Hand* for EastLake Church families with children with special needs (2016-present)

PROFESSIONAL ASSOCIATIONS

- President-Elect – American Baseball Biomechanics Society (2023-present)
- Guest Associate Editor – Frontiers in Sports and Active Living (2022-present)
- Director – American Baseball Biomechanics Society (2020-present)
- Member - American College of Sports Medicine (2018-present)
- Member - International Society of Biomechanics (2018-present)
- Reviewer – Medicine and Science in Sports and Exercise (2018-present)
- Reviewer - Sports Biomechanics (2017-present)
- Member – American Society of Biomechanics (2002-present)
- Member - International Society of Biomechanics in Sports (2001-present)
- Reviewer - American Journal of Sports Medicine (2012-present)
- Scientific Advisor - National Pitching Association (2006-2010)
- Member - National Athletic Trainers' Association (2006-2010)
- Reviewer - Gait & Posture (2003-2006)
- Member - Communications Committee, Gait and Clinical Movement Analysis Society (2001-2002)
- Member - Gait and Clinical Movement Analysis Society (2001-2011)
- Member - Whitaker Institute of Biomedical Engineering of UC San Diego (1998-2001)