

Jacob S. Layer, M.S.
University of Wyoming
Assistant Lecturer

Division of Kinesiology & Health
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Education

2017 ~ Present	Candidate - Doctorate of Philosophy (ABD – Summer 2026) University of Wyoming Concentration: Biomedical Sciences – Kinesiology Minor: Statistics
2015 ~ 2017	Master of Science University of Wyoming Concentration: Kinesiology
2013 ~ 2015	Bachelor of Arts Capital University (Columbus, Ohio) Concentration: Exercise Science Minor: Psychology
2010 ~ 2012	Columbus State Community College Concentration: Exercise Science

Professional Experience

2022 ~ present	Assistant Lecturer / Lead Faculty Instructor for Undergraduate Human Anatomy / Laboratory Administrator Division of Kinesiology & Health University of Wyoming
2015 ~ 2022	Teaching Assistant / Research Assistant / Laboratory Coordinator Division of Kinesiology & Health University of Wyoming

2014 ~ 2015	Teaching Assistant Department of Health and Sport Science Capital University - Columbus, Ohio
2014 ~ 2015	Intern / Group Fitness Instructor Movement for Multiple Sclerosis, Columbus, OH
2012 ~ 2013	Strength and Conditioning Coach / Personal Trainer / Group Fitness Instructor The Spot Athletics, Columbus, OH
2008 ~ 2012	Chief Scout / Scout Sniper 3 rd Battalion, 24 th Marines, H&S Co United States Marine Corps
2005 ~ 2008	Infantry Assaultman (Breacher / SMAW Gunner) 1 st Battalion, 24 th Marines, Weapons Co. United States Marine Corps

Awards and Honors

2025	“ <i>TOP PROF</i> ” Award The Cap and Gown Chapter of Mortar Board University of Wyoming
2023	Fall Semester Featured LAMP Fellow University of Wyoming Science Initiative <i>Learning Actively Mentoring Program</i>
2017	Second Place in Student Oral Presentations. University of Wyoming College of Health Sciences Grand Rounds <i>Biomechanical comparison of isometric back and belt squats</i>

2012 Navy Achievement Medal
 United States Marine Corps
 Chief Scout - 3rd Battalion, 24th Marines, H&S Co., Scout Sniper Platoon

Grants & Funding

1. Title: *LAMP Educator Learning Community*
 Funding Agency: UW Science Initiative, Learning Actively Mentoring Program
 Duration: 2024
 Amount: Travel Expenses to 2024 Original Lilly on College Teaching
 Type: Travel
 2. Title: *LAMP Fellowship*
 Funding Agency: UW Science Initiative, Learning Actively Mentoring Program
 Duration: 2023 ~ 2024
 Amount: \$5000
 Type: Teaching
 3. Title: *Biomechanics of the Belt and Back Squats.*
 Funding Agency: UW College of Health Sciences, Biomedical Sciences Program
 Duration: Spring 2020
 Amount: \$1,200
 Type: Research
 4. Title: *Wyoming INBRE Graduate Assistance Fellowship*
 Funding Agency: NIH NIGMS IDeA Program
 Duration: 2019 ~ 2021
 Amount: \$64,328 in salary, plus tuition, fees, and insurance
 Type: Student Aid
 5. Title: *Wyoming INBRE Graduate Assistance Fellowship*
 Funding Agency: NIH NIGMS IDeA Program
 Duration: 2018 ~ 2019
 Amount: \$26,200 in salary plus tuition, fees, and insurance
 Type: Student Aid
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Publications (Book Chapters)

1. Dai, B., **Layer, J.S.** (2018). Strength assessments: neuromuscular and biomechanical considerations. In Bagch, D., Nair, S., & Sen, C.K. (Eds.), Nutrition and enhanced sports performance (pp. 471-481). Cambridge, MA: Academic Press.

Publications (Peer-Reviewed Journal Articles)

1. Song Y, Li L, **Layer J**, Fairbanks R, Hughes G, Smith D, Wilson M, Zhu Q, Dai B. Unanticipated mid-flight external trunk perturbation increased frontal plane ACL loading variables during sidestep cuttings. J Sports Sci. 2024 Apr;42(7):599-610. <https://doi.org/10.1080/02640414.2024.2353404> . Epub 2024 May 12. PMID: 38734986; PMCID: PMC11157851.
2. Song Y, Li L, **Layer J**, Hughes G, Smith D, Wilson M, Zhu Q, Dai B. Falling decreased anterior cruciate ligament loading variables during single-leg landings after mid-flight external trunk perturbation. J Electromyogr Kinesiol. 2024 Feb;74:102849. doi: <https://doi.org/10.1016/j.jelekin.2023.102849> . Epub 2023 Nov 30. PMID: 38061150.
3. Yu Song, Ling Li, Jacob Layer, Raychl Fairbanks, Maddy Jenkins, Gerwyn Hughes, Derek Smith, Margaret Wilson, Qin Zhu, Boyi Dai, Indirect contact matters: Mid-flight external trunk perturbation increased unilateral anterior cruciate ligament loading variables during jump-landings, Journal of Sport and Health Science, 2022, ISSN 2095-2546, <https://doi.org/10.1016/j.jshs.2022.12.005>.
4. Huang S, **Layer J**, Smith D, Bingham GP, Zhu Q. The effect of movement frequency on perceptual-motor learning of a novel bimanual coordination pattern. Hum Mov Sci. 2022 Jun;83:102958. <https://doi.org/10.1016/j.humov.2022.102958> . Epub 2022 May 10. PMID: 35561528.
5. Huang S, **Layer J**, Smith D, Bingham GP, Zhu Q. Training 90° bimanual coordination at high frequency yields dependence on kinesthetic information and poor performance of dyadic unimanual coordination. Hum Mov Sci. 2021 Oct;79:102855. <https://doi.org/10.1016/j.humov.2021.102855> . Epub 2021 Aug 10. PMID: 34388488; PMCID: PMC8453090.
6. Li L, McGuinness BK, **Layer JS**, Song Y, Jensen MA, Dai B. Longitudinal assessments of strength and dynamic balance from pre-injury baseline to 3 and 4 months after labrum repairs in collegiate athletes. Physiother Theory Pract. 2021 Jun 7:1-9. doi: <https://doi.org/10.1080/09593985.2021.1934925> . Epub ahead of print. PMID: 34098835; PMCID: PMC8648851.
7. Dai B, **Layer JS**, Bordelon NM, Critchley ML, LaCroix SE, George AC, Li L, Ross JD, Jensen MA. Longitudinal assessments of balance and jump-landing performance before and after anterior

- cruciate ligament injuries in collegiate athletes. *Res Sports Med.* 2021 Mar-Apr;29(2):129-140. doi: <https://doi.org/10.1080/15438627.2020.1721290> . Epub 2020 Feb 2. PMID: 32009460; PMCID: PMC7395857.
8. Goršič M, Rochelle LE, **Layer JS**, Smith DT, Novak D, Dai B. Biomechanical comparisons of back and front squats with a straight bar and four squats with a transformer bar. *Sports Biomech.* 2024 Feb;23(2):166-181. <https://doi.org/10.1080/14763141.2020.1832563> . Epub 2020 Nov 9. PMID: 33161870; PMCID: PMC8106690.
 9. Dai B, **Layer JS**, Hinshaw TJ, Cook RF, Dufek JS. Kinematic Analyses of Parkour Landings from as High as 2.7 Meters. *J Hum Kinet.* 2020 Mar 31;72:15-28. <https://doi.org/10.2478%2Fhukin-2019-0123> . PMID: 32269644; PMCID: PMC7126243.
 10. Dai B, **Layer JS**, Bordelon NM, Critchley ML, LaCroix SE, George AC, Li L, Ross JD, Jensen MA. Longitudinal assessments of balance and jump-landing performance before and after anterior cruciate ligament injuries in collegiate athletes. *Res Sports Med.* 2021 Mar-Apr;29(2):129-140. <https://doi.org/10.1080/15438627.2020.1721290> . Epub 2020 Feb 2. PMID: 32009460; PMCID: PMC7395857.
 11. Critchley ML, Davis DJ, Keener MM, **Layer JS**, Wilson MA, Zhu Q, Dai B. The effects of mid-flight whole-body and trunk rotation on landing mechanics: implications for anterior cruciate ligament injuries. *Sports Biomech.* 2020 Aug;19(4):421-437. <https://doi.org/10.1080/14763141.2019.1595704> . Epub 2019 Apr 4. PMID: 30945626; PMCID: PMC6776723.
 12. Dai B, **Layer J**, Vertz C, Hinshaw T, Cook R, Li Y, Sha Z. Baseline Assessments of Strength and Balance Performance and Bilateral Asymmetries in Collegiate Athletes. *J Strength Cond Res.* 2019 Nov;33(11):3015-3029. <https://doi.org/10.1519/jsc.0000000000002687> . PMID: 29985219.
 13. Hinshaw TJ, Davis DJ, **Layer JS**, Wilson MA, Zhu Q, Dai B. Mid-flight lateral trunk bending increased ipsilateral leg loading during landing: a center of mass analysis. *J Sports Sci.* 2019 Feb;37(4):414-423. <https://doi.org/10.1080/02640414.2018.1504616> . Epub 2018 Jul 30. PMID: 30058949.
 14. **Layer JS**, Grenz C, Hinshaw TJ, Smith DT, Barrett SF, Dai B. Kinetic Analysis of Isometric Back Squats and Isometric Belt Squats. *J Strength Cond Res.* 2018 Dec;32(12):3301-3309. <https://doi.org/10.1519/jsc.0000000000002854>
 15. Beardt BS, McCollum MR, Hinshaw TJ, **Layer JS**, Wilson MA, Zhu Q, Dai B. Lower-Extremity Kinematics Differed Between a Controlled Drop-Jump and Volleyball-Takeoffs. *J Appl Biomech.* 2018 Aug 1;34(4):327-335. <https://doi.org/10.1123/jab.2017-0286> Epub 2018 Jul 13. PMID: 29613821.

16. Dai, B., **Layer, J.S.**, & Hinshaw, T.J. (2016). Posture-specific strength and landing mechanics. *Lower Extremity Review Magazine*, 8(6):43-47. <https://lermagazine.com/article/posture-specific-strength-and-landing-mechanics>

Presentations

1. **Layer, J.S.**, Watson, R.M., Boggs, C.N, (2024). Scalable Visual Framework of Teaching and Learning for Near-Peer Mentors. Oral presentation at Original Lilly Conference on College Teaching, Oxford, OH
 2. **Layer, J.S.**, (2024) Using Blended Active Learning Strategies to Illuminate Muscle Structure and Function for Beginner, Intermediate, and Advanced Learners. Poster presentation at Learning Actively Mentoring Program Graduation, Laramie, WY.
 3. Song, Y., Li, L, **Layer, J.S.**, Fairbanks, R., Jenkins, M., Hughes, G., Smith, D., Wilson, M., Zhu, Q., Dai, B. (2022). The Effect of Mid-Flight External Perturbation on double-leg Landing Mechanics. Oral Presentation at Rocky Mountain Chapter of American Society of Biomechanics, Estes Park, CO.
 4. Dai, B., **Layer, J.S.**, Bordelon N.M., LaCroix S.E., Critchley M.L., Ross J.D. (2019). Longitudinal assessments of balance and jump-landing performance in collegiate athletes pre and post ACL injuries. Oral presentation at International Society of Biomechanics in Sports Meeting, Oxford, OH.
 5. Bordelon N.M., **Layer, J.S.**, LaCroix S.E., Critchley M.L., Ross J.D., Dai, B. (2019). Post-ACL injury balance and jump landing asymmetries in collegiate athletes. Oral presentation at National Strength and Conditioning Association National Conference, Washington, DC.
 6. Critchley, M.L., Davis, D.J., Keener, M.M., **Layer, J.S.**, & Dai, B. (2018). The effect of mid-flight whole-body and trunk rotation on landing mechanics. Poster at American Society of Biomechanics Meeting, Rochester, MN.
 7. Keener, M.M., Critchley, M.L., **Layer, J.S.**, Dai, B. (2018). The effect of stirrup length on impacts on the rider. Poster at Rocky Mountain Chapter of American Society of Biomechanics, Estes Park, CO.
 8. Critchley, M.L., Davis, D.J., Keener, M.M., **Layer, J.S.**, & Dai, B. (2018). The effect of mid-flight rotation on landing mechanics. Poster at 2018 PAMA Symposium, Orange, CA.
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9. Dai, B., **Layer, J.S.**, Hinshaw, T.J., Cook, R.F., Dufek, J.S. (2017). Kinematic analysis of Parkour landings from a drop height of 2.7 meters. Poster at American Society of Biomechanics Meeting, Boulder, CO.
10. Hinshaw, T.J., Davis, D.J., **Layer, J.S.**, Dai, B. (2017). Mid-flight trunk motion increased unilateral loading during landing: a center of mass analysis. Poster at American Society of Biomechanics Meeting, Boulder, CO.
11. Beardt, B.S., McCollum, M.R., Hinshaw, T.J., **Layer, J.S.**, Dai, B. (2017). Landing mechanics in controlled screening tasks and simulated games in volleyball. Poster at American Society of Biomechanics Meeting, Boulder, CO.
12. **Layer, J.S.**, Grenz, C., Hinshaw, T.J., Dai, B. (Accepted). Biomechanical comparison of isometric back and belt squats. Oral presentation at University of Wyoming College of Health Sciences Grand Rounds, Laramie, WY.
13. Hinshaw, T.J., Davis, D.J., **Layer, J.S.**, Dai, B. (Accepted). Mid-flight trunk motion increased unilateral loading during landing: a center of mass analysis. Poster at Rocky Mountain Chapter of American Society of Biomechanics, Estes Park, CO.
14. Beardt, B.S., McCollum, M.R., Hinshaw, T.J., **Layer, J.S.**, Dai, B. (Accepted). Landing mechanics differed between controlled screening tasks and simulated volleyball games. Poster at Rocky Mountain Chapter of American Society of Biomechanics, Estes Park, CO.
15. Dai, B., Cosgrove, M.J., Hinshaw, T.J., Olive S.L., **Layer, J.S.**, & Li, Y. (2016). Association between bilateral strength and balance asymmetries in collegiate athletes. Poster at American Society of Biomechanics Meeting, Raleigh, NC.

Courses Taught

University of Wyoming

PEAC 1001: Physical Activity and Your Health

HLED 1006: Personal Health

KIN 2040: Human Anatomy

KIN 2041: Human Anatomy Lab

KIN 3021: Physiology of Exercise

KIN 3040: Teaching in Human Anatomy
 KIN 3042: Biomechanics of Human Movement
 KIN 4097: Mentoring in Human Anatomy
 KIN 4900: Applied Muscle Physiology and Related Signaling

Professional Service

Reviewer

Journal of Strength and Conditioning Research

Sports Biomechanics

BMC Musculoskeletal Disorders

Student Mentorship

M.S. Candidates

Chair

2024-2025 Sadie McMullen (Univ. of Wyoming) Master's Plan B Chair (Dept: Kinesiology & Health)

Biomechanical Determinates of Long Jump Performance and Associated Coaching Strategies

Undergraduate Research Mentorship/Faculty Mentor

2025 Kassidy Brooks (Univ. of Wyoming) – Undergraduate Research Faculty Mentor (Dept: Kinesiology & Health)

2025 Joel Kirchner (Univ. of Wyoming) – Undergraduate Research Faculty Mentor (Dept: Kinesiology & Health)

2025 Michaela Settle (Univ. of Wyoming) – Undergraduate Research Faculty Mentor (Dept: Kinesiology & Health)

Undergraduate Honors Mentorship/Faculty Mentor

2023 Jatin Cranmore (Univ. of Wyoming) – Undergraduate Honors Project Faculty Mentor (Dept: Kinesiology & Health)

Professional Affiliations

Learning Actively Mentoring Program – Educator Learning Community

National Strength and Conditioning Association

Human Anatomy and Physiology Society

Other Certifications and Courses

2015	USAW Level 1 Sport Performance Coach Certification Course (Certification Expired)
2010	Tactical Shotgun Instructor Course
	Sig Sauer Academy, Epping, New Hampshire
2010	Glock Instructor Workshop
2010	Glock Armorer Course (Certification Expired)
2010	Observer/Sniper Course
	Indiana Law Enforcement Academy
2009	Tactical Combat Casualty Care Course (Certification Expired)
	US Marine Corps
2009	US Marine Corps Scout Sniper Basic Course
	Camp Pendleton, California

Other Relevant Experience

2025	Ute 100-mile trail race
2025	Big Horn 100-mile trail race (DNF)
2024	Never Summer “Dirty Double” 60k (Completed) & 100k (DNF)
2023	Big Horn 100-mile trail race
2022	Grand Mesa Ultra 50-mile trail race
2021	Pilot Hill 25k

2019	Quad Rock 25-mile
2016	Rocky Mountain 50K
2010 - 2015	Competitive Powerlifter
2013	Grip Strength National Championship Competitor
2011	Capital City Half Marathon
