

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE**

MALIKIE INNOVATIONS LTD., KEY
PATENT INNOVATIONS LTD.,
Plaintiffs,

v.

NINTENDO CO., LTD.,
NINTENDO OF AMERICA INC.,
Defendants.

NO. 2:24-cv-01490-JLR

Claim Construction Report by Gavin T. Garner, PhD

Introduction

1. I have been retained by Plaintiffs Malikie Innovations Limited and Key Patent Innovations Limited in support of litigation in case number 2:24-cv-01490 in the Western District of Washington. I have been asked to offer opinions on the meaning of certain terms in some of the patents being asserted in that action, including how a person of ordinary skill in the art (POSITA) would have understood them.
2. I am being compensated at a rate of \$300 per hour for work performed on this case. My compensation does not depend on the outcome of this litigation.

Qualifications

3. I am an Associate Professor of Mechanical and Aerospace Engineering at the University of Virginia and serve as the Director of Experiential Learning for the School of Engineering and Applied Science at the University of Virginia. I have been teaching engineering students since 2002. I hold an undergraduate degree in Physics from Colby College and Master's and PhD degrees in both Mechanical Engineering and Aerospace Engineering from the University of Virginia.
4. I am not an expert in patent law. The opinions expressed in this report are limited to how I believe a person of ordinary skill in the art at the time of the respective inventions (a POSITA) would have understood the disclosures and claim language in the patents discussed.
5. A copy of my CV that includes my publications for the last 10 years is attached as Exhibit 1. I have not testified at trial or by deposition in the last 4 years.

U.S. Patent 8,545,247

6. The '247 Patent claims a type of docking station and various features thereof for use with electronic devices. I understand that the defendants in this case have proposed that certain terms in some of the claims of the '247 Patent require construction in order to convey how a person of ordinary skill in the art would have understood them at the time of the invention. I have also been asked to evaluate the relationship between certain terms in the claims.

7. In my opinion, a person with ordinary skill in the field of the invention (POSITA), at the time the invention of the '247 patent (2011), would have been someone with a bachelor's degree in mechanical engineering or mechanical arts with one year of relevant experience or the equivalent.

“support”

Plaintiffs' Proposal	Defendants' Proposal
<i>No construction required.</i>	a structure that limits movement in a direction

8. I understand that the defendants have proposed that the term “support” in claims 1, 2, and 12 through 16 should be construed as “a structure that limits movement in a direction.” Based on my review of the claims and the '247 Patent, I disagree.

9. I believe that a POSITA at the time of the '247 Patent invention would have understood “support” in the context of the claims to have its ordinary meaning of a structure that helps to keep something (in this case, the connector) in some desired orientation, in other words something that “supports.” My opinion is consistent with the patent's specification, including column 5 rows 62 through 65 of the specification: “The connector support assembly 308 may be any support that is coupled to the housing 200 and includes a portion that elastically deforms in response to movement of the connector 400.” It is my opinion that a POSITA would not have required further definition of “support” in order to understand the claims.

10. The defendants' proposal is inconsistent with the disclosures in the specification that “allow[s] movement” by the support. Column 2, lines 15 through 18 states that, “[t]he dock includes a support for a connector including an elastically deformable portion for allowing movement of the connector relative to the dock when a force is applied.” It is my opinion that a POSITA would not understand a “support” to limit movement when the specification describes the invention as including a support that allows movement.

“inner wall”

Plaintiffs' Proposal	Defendants' Proposal
<i>No construction required.</i>	internal upright or vertical structure enclosing a space

11. I understand that the defendants have proposed that the term “inner wall” in claims 1, and 12 through 15 should be construed as “internal upright structure enclosing a space.” Based on my review of the '247 Patent, I disagree.

12. Firstly, the proposed construction is vague and ambiguous because it does not identify what the structure is internal to. Secondly, it improperly adds the limitation of “enclosing a

space,” which is not a required characteristic of a “wall”; moreover, “enclosing” itself is vague and ambiguous because there may be varying degrees of enclosure.

13. For their proposed construction, I understand that the defendants are relying on the separate definitions of “inner” and “wall” in the Webster’s New World College Dictionary from 2005. There, “inner” is defined as “located farther within; interior; internal” and “wall” is defined as “an upright structure of wood, stone, brick, etc., serving to enclose, divide, support, or protect.” In my opinion, a POSITA’s understanding of the term “support” would not come from a generalist dictionary but instead would derive from the context of the claims and the specification, neither of which require the claimed “wall” to be “upright or vertical” nor that it “enclose a space.”

14. The dictionary definition of “wall” is directed to buildings and other civil structures, not the electronic product that is the subject of the ’247 Patent. Thus, adding a restriction that the wall be “upright” is not something a POSITA would have considered in an object whose orientation can be manipulated by hand. It is therefore my opinion that adopting the defendants’ proposed construction would be incorrect and would add improper restrictions to the term, contrary to how a POSITA would have understood it, in view of the patent’s disclosures.

15. It is also my opinion that a POSITA at the time the ’247 Patent was filed (2011) would have understood “inner wall” in this context to have its ordinary meaning of the wall of the housing to which a support is coupled. Column 4, rows 14 through 32 of the specification supports my opinion.

The housing 200 may be molded plastic, machined metal or wood, for example. The housing may be a single part or may be an assembly of multiple parts.

The dock 150 includes a connector support assembly 308 that is coupled to an inner surface of the housing 200. In general, components are coupled to one another when movement of one component affects movement in the other component. Coupling may be permanent, such as by welding for example, or may be reversible. Such as connection by fasteners, for example. Coupling may include direct contact between the two components or the components may be spaced from one another with additional components being provided to achieve coupling between the two components. In one example, screws 310 couple lugs 312 of the support assembly 308 to screw-receiving components 314, which extend from an underside surface 316 of the seat 302, to couple the support assembly 308 to the housing 200.

It is therefore also my opinion that a POSITA would not have needed further definition to understand the meaning of “inner wall” in the context of the claims.

“housing”

Plaintiffs’ Proposal	Defendants’ Proposal
<u>a housing</u>	See longer phrase ..., indefinite as to full scope

16. A “housing” is a structure present in each of the claims of the ’247 Patent. It is labeled as structure 200 in some of the figures as well. It is clear that the housing referred to throughout the ’247 Patent refers to the structure of the dock, as distinct from the dock’s electronic components.

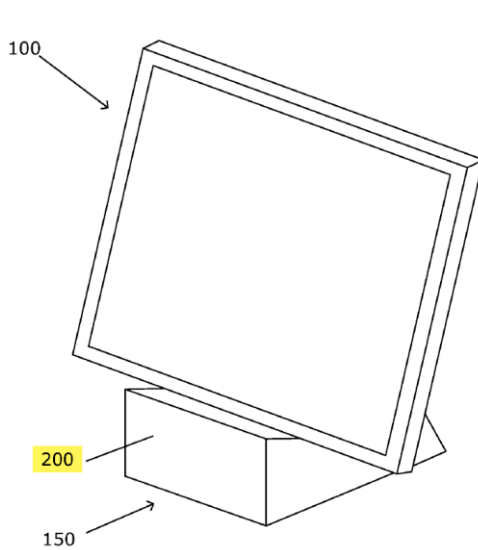


FIG. 2

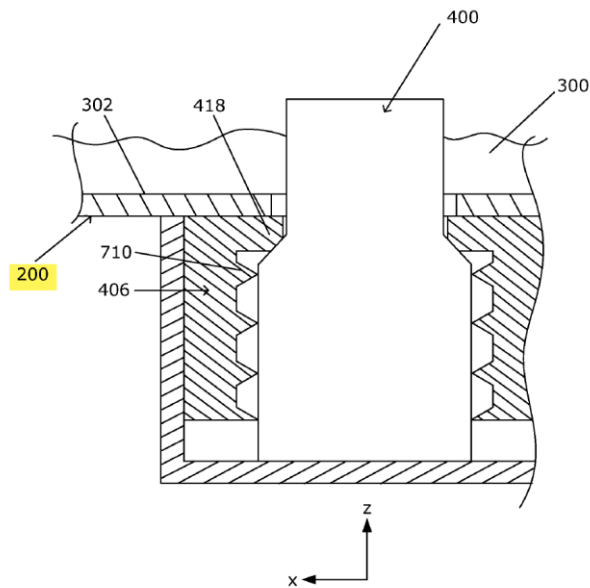


FIG. 7

17. Claims 14 and 19 refer to “the housing” without first introducing “a housing.” I understand that it is routine in patent drafting to first introduce structures with an indefinite article to provide antecedent basis. Based on my understanding of “housing” from the specification and other claims in the ’247 Patent, it is clear that “the housing” in claims 14 and 19 is referring to the same structure as “a housing” refers to in other claims and not some other structure. It is therefore my opinion that a POSITA would understand “the housing” to mean “a housing” in the context of claims 14 and 10.

“aperture”

Plaintiffs’ Proposal	Defendants’ Proposal
<u>an</u> aperture	See longer phrase ..., indefinite as to full scope

18. An “aperture” is a structure present in almost all of the claims of the ’247 Patent. It is labeled as structure 402 in some of the figures as well. It is clear that the aperture referred to throughout the ’247 Patent refers to a particular opening and passageway in the housing.

19. Claim 14 refers to “the aperture” without first introducing “an aperture.” For the same reasons as my opinion regarding “housing,” it is my opinion that a POSITA would understand “the aperture” to mean “an aperture” in the context of claim 14.

“connector”

Plaintiffs’ Proposal	Defendants’ Proposal
<i>The first instance of “the connector” should be construed as “a connector” and vice versa.</i>	<i>No construction required.</i>

20. A “connector” is a structure present in all of the claims of the ’247 Patent. It is labeled as structure 400 in some of the figures as well. It is clear that the connector referred to throughout the ’247 Patent refers to a structure carrying electronic connections situated in the dock to which the removeable device connects (for the purposes of data communication and/or powering/charging) via the dock.

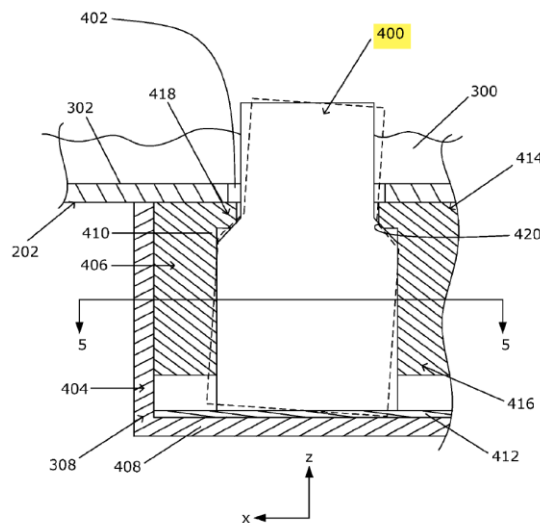


FIG. 4

21. Claims 12 and 13 refer to “the connector” without first introducing “a connector.” For the same reasons as my opinion regarding “housing” and “aperture,” it is my opinion that a POSITA would understand the first instance of “the connector” in those claims to mean “a connector” and the first instance of “a connector” to mean “the connector.”

“the top end being located adjacent the aperture of the housing”

Plaintiffs’ Proposal	Defendants’ Proposal
<i>No construction required.</i>	<i>Indefinite as to full scope</i>

22. I understand that the defendants have proposed that the term “the top end being located adjacent the aperture of the housing” in claim 14 renders the claim indefinite. Based on my review of the ’247 Patent, I disagree.

23. For the reasons above, the terms “housing” and “aperture” are not indefinite.

24. It is my opinion that a person of ordinary skill in the art of the '247 Patent would have readily understood “the top end” in the above phrase refers to the top end of the “support element.” The surrounding text makes this clear:

wherein the passage comprises ribs for contacting the connector and a cross-sectional area of the ribs is reduced between **a top end of the spring component** and a bottom end of the spring component, **the top end** being located adjacent the aperture of the housing.

U.S. Patent 8,115,731

“a direction substantially parallel or substantially perpendicular to the orientation”

Plaintiffs’ Proposal	Defendants’ Proposal
<i>No construction required.</i>	<i>Indefinite as to full scope</i>

25. The '731 Patent relates to control of an electronic device by sensing orientation. I understand that the defendants in this case have taken the position that the phrase in claim 1 of the patent, “a direction substantially parallel or substantially perpendicular to the orientation,” is indefinite. I have also been asked to provide my opinion on how a POSITA at the time of the invention (2005) would have understood that phrase.

26. In my opinion, a person with ordinary skill in the field of the invention (POSITA), at the time the invention of the '731 patent, would have been someone with a bachelor’s degree in mechanical engineering or mechanical arts with one year of relevant experience or the equivalent.

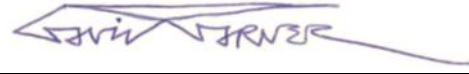
27. For context, that phrase at issue includes the following surrounding text:

wherein the operating system comprises processor-executable instructions that cause the graphical element to move by the amount of displacement in a direction substantially parallel or substantially perpendicular to the orientation.

28. The '730 Patent discusses the orientation of an electronic device throughout the specification. It is clear to me, especially through reference to figures 2 through 5, that the “direction” of the “orientation” is the direction in which the handheld device is tilted relative to a neutral position. In the context of the patent, a tilt of the device to the right is an example of the device being oriented in the right direction, in which case a graphical element might move to the right of the screen, thus moving in parallel to the new orientation of the device. Therefore, it is my opinion that a POSITA would have understood the phrase “a direction substantially parallel or substantially perpendicular to the orientation” with reasonable certainty, as meaning that something will move on the screen in a direction that is substantially parallel or perpendicular to the direction that the device is being physically oriented or reoriented.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge and belief.

Executed: August 6, 2025

A handwritten signature in purple ink, appearing to read "Gavin T. Garner", is written over a horizontal line.

Gavin T. Garner, PhD

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Education

- *The University of Virginia*, Charlottesville, Virginia. Graduated August 2009 with a Doctor of Philosophy degree in Mechanical and Aerospace Engineering. Advisor: Pradip. N. Sheth
- *The University of Virginia*, Charlottesville, Virginia. Graduated May 2006 with a Master of Science degree in Mechanical and Aerospace Engineering. Advisor: Pradip. N. Sheth
- *Colby College*, Waterville, Maine. Graduated May 2001 with a Physics major & Music minor
- *St. Mark's School*, Southborough, Massachusetts. Graduated May 1997 with distinction

Employment History

- Associate Professor, University of Virginia, August 2018 – present
- Assistant Professor, University of Virginia, August 2010 – July 2018
- Lecturer and Postdoctoral Research Scientist, University of Virginia, August 2009-May 2010
- Graduate Teaching Assistant, University of Virginia, August 2002-May 2009 (every semester)
- Mechanical Engineering Intern, AMF Bowling Worldwide Inc., Richmond, Virginia (corporate headquarters), 2001-2002.
- Physics Laboratory Teaching Assistant and Tutor, Colby College, 1998-2001.

Substantial Honors and Awards

- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2024-2025 academic year**
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2023-2024 academic year**
- Invited and inducted into the University of Virginia's **Raven Society**, an honor society comprised of students and faculty (2024)
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2021-2022 academic year** (voted on by all U.Va. undergraduate Mechanical Engineering students).
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2019-2020 academic year** (voted on by all U.Va. undergraduate Mechanical Engineering students).
- Presented with a special, framed letter of recognition from **The Society of P.R.I.** (a secret society) stating among other things that "Rarely does a faculty member distinguish themselves by altruistically putting their students' and their communities' time above their own, so readily. As a community we are truly lucky to count you a member." (May 2020)
- Presented with a special, framed letter of commendation from **The Society of P.R.I.** (a secret society) for commitment to providing "a great deal of service, respect, and passion for the University" and for acting as a strong resource in every aspect of student life and unwavering dedication to others. (April 2019)
- Presented with the **2018 Hartfield Excellence in Teaching Award** by the Jefferson Scholars Foundation, which recognizes "faculty members who exemplify the highest standards and practices of teaching." First faculty member to ever receive this award twice.

- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2016-2017 academic year** (voted on by all U.Va. undergraduate Mechanical Engineering students).
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2015-2016 academic year** (voted on by all U.Va. undergraduate Mechanical Engineering students).
- Presented with the **Henry Kinnier Award** that enables an Engineering School faculty member to participate in the University of Virginia's Mead Endowment program, which "allows faculty to engage with students in meaningful and memorable ways through creative projects." (**2014-2015 academic year**)
- Invited to present one of only two lectures for the **22nd Annual University of Virginia's Last Lecture Series** event to an audience of over 500 students, faculty, and friends of the University in Old Cabell Hall. (**April 2014**)
- Presented with the **Thomas E. Hutchinson Award** "For outreach to students, enthusiastic lectures, obvious love of teaching, and contribution to the Engineering School" a school-wide, student-nominated award organized by the Trigon Engineering Society. (**January 2014**)
- Presented with an honorary carved pumpkin (one of ten awarded annually across the University) and letter of commendation by the University of Virginia's secret **P.U.M.P.K.I.N. Society** "For enriching the University through silent and selfless achievement." (**October 2012**)
- Presented with a **Hartfield-Jefferson Scholars Teaching Prize** in recognition of excellent undergraduate teaching in the School of Engineering and Applied Sciences at the University of Virginia. (**May 2012**)
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2011-2012 academic year**.
- Honored by the University of Virginia's Trigon Engineering Society as a finalist for the Thomas E. Hutchinson Award "For contributions to students of the engineering school." (January 2012)
- Presented with the University of Virginia's School of Engineering and Applied Science **Mac Wade Award** "For outstanding service to the school and its students." (**May 2011**)
- Presented with the University of Virginia's **Rodman Scholars' Professor of the Year Award** for the **2010-2011 academic year**.
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2010-2011 academic year**.
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2009-2010 academic year**.
- Named a **ASME Graduate Teaching Fellow** (one of two in the nation) by the American Society of Mechanical Engineers for the **2008-2009 academic year**.
- Presented with the Mechanical Engineering **Faculty Teacher of the Year Award** by the University of Virginia's chapter of Pi Tau Sigma for the **2007-2008 academic year** (while technically still only a graduate student).
- Named a **ASME Graduate Teaching Fellow** (one of two in the nation) by the American Society of Mechanical Engineers for the **2007-2008 academic year**.
- Awarded the University of Virginia's **Class of 1985 Graduate Fellowship for Creative Teaching** "in recognition of superb teaching and excellent skills in creatively motivating and engaging students." (**April 2005**)
- Honoree for the University of Virginia's **Seven Society Graduate Fellowship for Superb Teaching** "in recognition of excellent teaching and exceptional skill in motivating and inspiring students." (**April 2005**)

Publications

Published Archival Peer-reviewed Journal Articles:

- Rachel K Bour, Gavin T Garner, Shayn M Peirce, George J Christ “Optimized Biomanufacturing for Treatment of Volumetric Muscle Loss Enables Physiometric Recovery” *Tissue Engineering Part A* 6/27/2024
- Krauss, ST, AQ Nauman, GT Garner, JP Landers “Color manipulation through microchip tinting for colorimetric detection using hue image analysis” *Lab on a Chip*. Volume 17 Issue 23 Pages 4089-4096, Royal Society of Chemistry 2017.
- Jackson, Kimberly & Borba, Juliane & Mejia, M & Mills, D.L. & Haverstick, D.M. & Olson, K.E. & Aranda, R & Garner, G.T. & Carrilho, Emanuel & Landers, James. (2016). “DNA purification using dynamic solid-phase extraction on a rotationally-driven polyethylene-terephthalate microdevice.” *Analytica Chimica Acta*. Pages 1-10, 10.1016/j.aca.2016.06.036. (Co-supervisor of this work)
- Thompson, Brandon & J. Gilbert, Rachel & Mejia, Maximo & Shukla, Nishant & M. Haverstick, Doris & Garner, Gavin T. & Landers, James. (2016). “Hematocrit analysis through the use of an inexpensive centrifugal polyester-toner device with finger-to-chip blood loading capability.” *Analytica Chimica Acta*. 924. Pages 1-8. 10.1016/j.aca.2016.04.028. (Co-supervisor of this work)
- Jacquelyn A. DuVall, Scott T. Cabaniss, Morgan L. Angotti, John H. Moore, Mayuresh Abhyankar, Nishant Shukla, Daniel L. Mills, Bryan G. Kessel, Gavin T. Garner, Nathan S. Swami, and Landers, JP. (2016) “Rapid detection of *Clostridium difficile* via magnetic bead aggregation in cost-effective polyester microdevices with cell phone image analysis.” *The Analyst* Volume 141, Issue 19, pages 5637-5645. 10.1039/C6AN00674D (Co-supervisor of this work)
- Pan, E., J. Chiu, K. Inkelas, G. Garner, S. Russell, and E. Berger “Affordances and Constraints of Physical and Virtual Manipulatives for Learning Dynamics,” *International Journal of Engineering Education* Vol. 31, No. 6(A), pages 1–16, 2015 0949-149X/91 (Co-supervisor of this work)
- Bauer, M. L., C. M Bauer, M. C. Fish, R. E. Matthews, G. T. Garner, A. W. Lichenberger, P. M. Norris, et al., “Thin-Film Aerogel Thermal Conductivity Measurements via 3ω ”, *Journal of Non-Crystalline Solids*, 357, pages 2960-2965, 2011. (Co-supervisor of this work)

Published Archival Peer-reviewed Conference Proceedings:

- G. Garner, “Designing Electric Guitars to Teach Mechatronics and Advanced Manufacturing Techniques”, *Proceedings of the 2017 American Society for Engineering Education Annual Conference & Exposition*, June 2017. (Primary and sole supervisor of this work)
- Thompson, B., Y. Ouyang, J. Li, S. Krauss, N. Shukla, B. G. Kessel, D. M. Haverstick, G. T. Garner, J. P. Landers, “Protein quantitation from whole blood on polyester-toner laser-printed microfluidic disc with cell phone image analysis.” *MicroTAS Conference Proceedings*, October 2014. 3 pages (Co-supervisor of this work)
- Thompson, Brandon L., Yiwen Ouyang, Jingyi Li, Shannon T. Krauss, Nishant Shukla, Bryan G. Kessel, Doris M. Haverstick, Gavin T. Garner, and James P. Landers. (2014). “Protein and Hematocrit Quantitation from Whole Blood on Polyester-Toner Laser-Printed Microfluidic Discs with Cell Phone Image Analysis.” *18th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, MicroTAS 2014. (Co-supervisor of this work)
- G. Garner, “Programming Printers Printed by 3D Printers”, *Proceedings of the 2013 American Society for Engineering Education Annual Conference & Exposition*, Paper #7895, June 2013. (Primary and sole supervisor of this work)

Books:

- Currently working under contract with Parallax, Inc. to publish a book (as the sole author) of approximately 300 pages titled Exploring Mechatronics.

Selected Invited Lectures, Conferences, Boards, and Other Notable Events and Services

- Presented a 2-hour live online presentation on *The University of Virginia's Mechatronics Program* (hosted by Parallax Inc. and watched by around 500 attendees and viewers of the recordings) March 30, 2022.
- Invited to serve on a panel of experts selected from industry and academia by the Virginia Department of Education's Office of Career, Technical, and Adult Education to review the Mechatronics I, II, & III high school and community college program curriculum for the state (February 16, 2021).
- Presented a 2-hour webinar on *Teaching College-level Engineering Courses with the Propeller 2 Microcontroller Chip* (hosted by Parallax Inc. and watched by around a thousand attendees and viewers of the recordings) May 19, 2021.
- Presented a seminar on Additive Manufacturing Technologies for the Darden School of Business (April 23, 2019 with follow-up encore seminar October 24, 2019)
- Presented the keynote speech that kicked off the Society of Hispanic Engineers' High School Visitation Weekend (April 5, 2019)
- Presented a special two-hour seminar to members of the Defense Intelligence Agency to train them on Cybersecurity Vulnerabilities related to Additive Manufacturing as well in the design of a "sentinel" device that I have invented (in collaboration with Barry Horowitz) to help secure such cyber physical systems from cyber attacks (August 2017)
- Served on a board of experts selected from industry and academia by the Virginia Department of Education's Office of Career, Technical, and Adult Education to develop the Mechatronics I, II, & III high school and community college program curriculum for the state (May 11-12, 2017 Richmond, Virginia).
- Collaborated with U.Va.'s Center for Diversity in Engineering to organize and lead an afternoon workshop for our BRIDGE students on Mechatronics and 3D Printing (July 2017)
- Served as a peer reviewer on two papers for the *3D Printing and Additive Manufacturing* journal (2017)
- Served as a peer reviewer for the *Advances in Engineering Education* journal (2017)
- Coached the University of Virginia's HoosMining team during the annual, week-long, NASA Robotics Mining Competition, which is broadcast worldwide in May 2017, May 2016, May 2015 and May 2014 in Cape Canaveral, Florida and advised and worked alongside them throughout each year
- Invited to give the keynote speech at the University of Virginia's annual Trigon Society's Rotunda Dinner (January 2015)
- Presented during and helped lead the National Academy of Engineering's Frontiers of Engineering Education (FOEE) Symposium (October 2014; Irvine, California)
- Invited to present the opening talk for the 2nd Annual Charlottesville Mini Maker Faire (October 2014)
- Presented an hour-long seminar on Additive Manufacturing to the 5400 Men's Club (June 2014; Richmond, Virginia)
- Invited to present one of only two lectures for the 22nd Annual (2013-2014) University of Virginia's Last Lecture Series event to an audience of over 500 students, faculty, and friends of the University in Old Cabell Hall. (April 2014)
- Invited to presented the keynote speech for the University of Virginia's Mainland Student Network Graduation Dinner (April 2014)
- Invited and helped lead, review papers for, and present during a two-day National Science Foundation workshop on Cyber Physical Systems (March 2014; Washington, DC)

- Attended ASME's annual International Mechanical Engineering Conference and Exposition (IMECE) and coached the University of Virginia's regional-winning team in the student design competition international finals (November 2013; San Diego, California)
- Presented during, served as a peer reviewer on several papers for, and served as the moderator for the Mechanical Division Hands-on/Experiential Learning Session of the ASEE Annual Conference and Exhibition (June 2013; Atlanta, Georgia)
- Invited to present a seminar on Additive Manufacturing for the first annual Confabulation Symposium on 3D Printing in the Classroom (June 2013; Largo, Maryland)
- Presented a seminar about 3D Printing in Education for the Inside 3D Printing Expo (April 2013; New York, New York)
- Presented a seminar on Advanced Manufacturing in Education for the Council on Competitiveness' Advanced Manufacturing Workshop (April 2013; Oak Ridge National Laboratory, Tennessee)
- Invited to participate in the National Academy of Engineering's Frontiers of Engineering Education (FOEE) Symposium (October 2012; Irvine, California)
- Attended ASME's annual International Mechanical Engineering Conference and Exposition (IMECE) and coached the University of Virginia's regional-winning team in the student design competition international finals (November 2012; Houston, Texas)

Patents and Provisional Patents Filed, Published, Granted

- *Multi-axis Robotic Sawmill for the Manufacture of Non-Planar Timber and Rotational Bandsaw Blade Guide*, Inventors: Kyle Schumann, Katie MacDonald, and Gavin Garner, U.S. Non-provisional Patent Application, filed on May 29, 2025.
- *Multi-axis Robotic Sawmill for the Manufacture of Non-Planar Timber and Rotational Bandsaw Blade Guide*, Inventors: Kyle Schumann, Katie MacDonald, and Gavin Garner, U.S. Provisional Patent Application No. 63/653,703, filed on May 30, 2024
- *Hermetically or aseptically sealed bioreactor system and related method thereof* Inventors: Gavin Garner and George Christ, [US Patent US20230357696A1](#) Published November 9, 2023
- *Bioreactor Control Device and Related Method Thereof* Inventors: Joshua David Remer, George Christ, and Gavin T. Garner. Patent was granted on October 11, 2022 as [US Patent 11,466,243](#)
- *System for Monitoring and Maintaining Separation* Inventors: Hossein Haj-Hariri, Gavin Garner, Mitra Haj-Hariri, Dara Haj-Hariri. Patent was granted on June 14, 2022 as [US Patent US20210176959A1](#)
- *Hermetically Sealed Bioreactor System and Related Method Thereof* Inventors: Gavin T. Garner and George J. Christ. U.S. Provisional Patent Application Serial No. 63/049,773 Filed on July 9, 2020
- *Devices, Systems and Methods for Sample Detection* Inventors: James P. Landers, Kimberly Renee Jackson, Daniel Mills, Gavin T. Garner, Jacquelyn A. Duvall, and Jingyi Li. United States Patent and Trademark Office Publication Number [US-2019-0054468-A1](#) (published on February 21, 2019) (World Patent# WO2017070571A3)
- *Bioreactor Control Device and Related Method Thereof* Inventors: Joshua David Remer, George Christ, and Gavin T. Garner. Application was published on August 3, 2017. Serial No. 62/370,331
- *Optical Imaging system for mRNA Marker Analysis and Related Method Thereof* Inventors: Kimberly Renee Jackson, James P. Landers, Gavin T. Garner, Jingyi Li, and Daniel Mills. Provisional Patent Application was filed on June 20, 2016.

- *DNA Lysis and Extraction on a Polyethylene Terephthalate (Pe) Rotationally-Driven Microdevice* Inventors: Kimberly R. Jackson, Gavin T. Garner, James P. Landers. Provisional Patent Application filed with USPO on October 23, 2015.
- *System-Aware Security Monitor for Computer-Controlled Mechanical Systems* Inventors: Bryan Kessel, Gavin T. Garner, Barry Horowitz. Provisional Patent filed with USPO on November 5, 2015.

Professional Society, Club, and Board Memberships

- Pi Tau Sigma Mechanical Engineering Honor Society – Faculty advisor of the University of Virginia’s Delta Xi chapter (since 2014) and member (2008-present)
- Faculty Fellow of the University of Virginia’s Jefferson Scholars Foundation (2012-present)
- American Society of Mechanical Engineers (ASME) – Faculty advisor of the University of Virginia’s student chapter (2009-2019, 2023) and member (2007-present, intermittently)
- Member of the American Society of Engineering Education (ASEE) (2008-present, intermittently)
- Member of the Science Advisory Board for the Science Museum of Virginia (2010-2018)
- Colonnade Club (the University of Virginia’s Faculty and Alumni Club) – Vice President and member of the Board of Governors (2014-2018)