



# Dr. Joseph T. Foley

*Assistant Professor, Reykjavík University*

## Education

- 2000–2007 **Doctor of Philosophy in Mechanical Engineering**, *Massachusetts Institute of Technology*
- 1998–1999 **Master of Engineering in Computer Science and Electrical Engineering**, *Massachusetts Institute of Technology*
- 1994–1999 **Bachelor of Science in Computer Science and Electrical Engineering**, *Massachusetts Institute of Technology*

## Doctor of Philosophy Dissertation

- title *Security Approaches for Radio Frequency Identification Systems*
- supervisor Professor Sanjay Sarma
- description Describes preventative measures and protection from the privacy invasion potential associated with ubiquitous Radio Frequency Identification (RFID) while still maintaining capabilities to track items and prevent theft. The unified RFID protection system is called TinFoil.

## Master Thesis

- title *An Infrastructure for Electromechanical Appliances on the Internet*
- supervisor Professor Sanjay Sarma
- description Design and implementation of an Radio Frequency Identification (RFID) and Internet enabled appliance. The design focused on general methods applicable to a wide variety of intelligent devices. Fundamental development of ONS and EPC technologies.

## Published Work

E. Puik, D. S. Cochran, J. T. Foley, and P. Foith-Förster, Eds., *Proceedings of the 15th International Conference on Axiomatic Design 2023*, vol. 849, Lecture Notes in Networks and Systems, June 23–25, Eindhoven, Netherlands: Springer, Cham, 2023

A. I. Sverrisson, B. Laxdal, I. Urbonas, and J. T. Foley, “Design of a bio-inspired gripper arm for mars sample retrieval,” in *Proceedings of the 15th International Conference on Axiomatic Design 2023*, E. Puik, D. S. Cochran, J. T. Foley, and P. Foith-Förster, Eds., ser. Lecture Notes in Networks and Systems, June 23–25, vol. 849, Eindhoven, Netherlands: Springer, Cham, 2023, pp. 149–163

E. W. Ruge, M. Rudkov, and J. T. Foley, “Designing an ergonomic geothermally heated pinecone seed extractor,” in *Proceedings of the 15th International Conference on Axiomatic Design 2023*, E. Puik, D. S. Cochran, J. T. Foley, and P. Foith-Förster, Eds., ser. Lecture Notes in Networks and Systems, June 23–25, vol. 849, Eindhoven, Netherlands: Springer, Cham, 2023, pp. 118–131

M. Kyas, J. T. Foley, and M. Foley, “Bringing reflective writing to the engineering classroom,” in *19th CDIO*

*International Conference, CDIO 2023 – Proceedings*, June 26–29, Engineering Education Research, NTNU Trondheim, Norway: Chalmers University of Technology, 2023, pp. 502–511

M. S. Guðjónsdóttir, H. Auðunsson, A. M. Donoso, G. Kristjánsson, I. Sæmundsdóttir, J. T. Foley, M. Kyas, A. Sripakagorn, J. Roslöf, J. Bennedsen, K. Edström, N. Kuptasthien, and R. Lyng, Eds., *Proceedings of 18th CDIO International Conference*, NTNU, Norway, Sep. 2022

M. Foley, J. T. Foley, and M. Kyas, “Embracing failure as an integral aspect of engineering education,” in *CDIO Annual International Conference*, June 13–15, Engineering Education Research, Reykjavík, Iceland, 2022, pp. 1009–1021. [Online]. Available: [https://en.ru.is/media/cdio2022/CDIO\\_2022\\_Proceedings.pdf](https://en.ru.is/media/cdio2022/CDIO_2022_Proceedings.pdf)

J. T. Foley and M. Kyas, “AD software engineering,” in *14th International Conference on Axiomatic Design (ICAD)*, J. Fradinho, A. M. Gonçalves-Coelho, and M. Cavique, Eds., June 23–25, vol. 1174, Lisbon, Portugal: IOP Conference Series: Materials Science and Engineering, 2021. [Online]. Available: <https://iopscience.iop.org/article/10.1088/1757-899X/1174/1/012025/meta>

F. Sudermann, K. M. Kjartansson, S. Á. Jakobsson, and J. T. Foley, “Mobile high voltage power line thermometer,” in *14th International Conference on Axiomatic Design (ICAD)*, J. Fradinho, A. M. Gonçalves-Coelho, and M. Cavique, Eds., June 23–25, vol. 1174, Lisbon, Portugal: IOP Conference Series: Materials Science and Engineering, 2021. [Online]. Available: <https://iopscience.iop.org/article/10.1088/1757-899X/1174/1/012026/meta>

J. T. Foley, “Choosing the right D for design,” in *CDIO Annual International Conference*, June 21–23, Advances in CDIO, Bangkok, Thailand, 2021, p. 12

N. P. Suh, M. Cavique, and J. T. Foley, Eds., *Design Engineering and Science*. Springer Nature, 2021, ISBN: 978-3030492311

J. Fradinho, A. M. Gonçalves-Coelho, and M. Cavique, Eds., *14th International Conference on Axiomatic Design (ICAD)*, vol. 1174, June 23–25, Lisbon, Portugal: IOP Conference Series: Materials Science and Engineering, 2021. [Online]. Available: <https://iopscience.iop.org/issue/1757-899X/1174/1>

J. T. Foley, E. Puik, L. Puik, J. Smith, and D. S. Cochran, “Complexity in the kitchen,” in *Design Engineering and Science*, N. P. Suh, M. Cavique, and J. T. Foley, Eds. Springer Nature, 2021, ch. 15, p. 31, ISBN: 978-3030492311

J. T. Foley, E. Puik, L. Puik, J. Smith, and D. S. Cochran, “Complexity in the kitchen,” in *13th International Conference on Axiomatic Design (ICAD)*, A. Liu, E. Puik, and J. T. Foley, Eds., October. 18–20, Sydney, Australia: MATEC Web of Conferences, 2019, p. 12. [Online]. Available: <https://www.matec-conferences.org/articles/mateconf/abs/2019/50/contents/contents.html>

E. C. N. Puik, J. T. Foley, D. S. Cochrand, and M. L. Betasolo, Eds., *Reports on Axiomatic Design 2018: Proceedings of the 12th International Conference on Axiomatic Design*. HU University of Applied Sciences Utrecht, the Netherlands, 2018, ISBN: 978-94-91903-02-1

D. M. Vossebeld, J. T. Foley, and E. Puik, “The complexity of mapping customer needs ... (and the myth of a unanimous customer),” in *12th International Conference on Axiomatic Design (ICAD)*, E. Puik, J. T. Foley, D. Cochran, and M. Betasolo, Eds., October. 9–11, Reykjavík, Iceland: MATEC Web of Conferences, 2018, p. 7

H. Helgason, Þ. Þórarinnsson, S. Ingvason, and J. T. Foley, “Design of a tablet holder with the help of axiomatic design,” in *12th International Conference on Axiomatic Design (ICAD)*, E. Puik, J. T. Foley, D. Cochran, and M. Betasolo, Eds., October. 9–11, Reykjavík, Iceland: MATEC Web of Conferences, 2018, p. 7

- J. T. Foley, V. Omelianov, S. Koziel, and A. Bekasiewicz, “Low-cost antenna positioning system designed with Axiomatic Design,” in *11th International Conference on Axiomatic Design (ICAD)*, O. Dodoun, Ed., Sep. 15–18, Iasi, Romania: MATEC Web of Conferences, 2017, p. 7
- J. T. Foley, E. Puik, and D. S. Cochran, “The faucet reloaded: Improving Axiomatic Design by example,” in *11th International Conference on Axiomatic Design (ICAD)*, O. Dodoun, Ed., Sep. 15–18, Iasi, Romania: MATEC Web of Conferences, 2017, p. 7
- J. T. Foley, G. Þ. Sigurðsson, J. S. Gunnarsson, J. Gautason, and Ó. J. Ólafsson, “Mobile motorcycle lift for the common man,” in *11th International Conference on Axiomatic Design (ICAD)*, O. Dodoun, Ed., Sep. 15–18, Iasi, Romania: MATEC Web of Conferences, 2017, p. 7
- J. T. Foley, A. F. Simonarson, H. Þ. Simonarson, L. F. Ægisson, and A. Þ. Goethe, “ADjustadesk — an adjustable height desk,” in *11th International Conference on Axiomatic Design (ICAD)*, O. Dodoun, Ed., Sep. 15–18, Iasi, Romania: MATEC Web of Conferences, 2017, p. 7
- A. Breznik, P. Planišič, and J. T. Foley, “Collaborative development of an open-source rocket control system,” in *IEEE 26th International Electrotechnical and Computer Science Conference ERK 2017*, Portorož, Slovenia, 2017, p. 4
- J. T. Foley and D. S. Cochran, “Manufacturing system design decomposition: An ontology for data analytics and system design evaluation,” in *Complex Systems Engineering and Development Proceedings of the 27th CIRP Design Conference*, May 10–12, Procedia CIRP, Cranfield University, UK: Elsevier ScienceDirect, 2017, pp. 175–180
- E. Pétursson, I. N. Karlsson, O. G. Garðarsson, P. Pálsson, V. O. Saulius Genutis, and J. T. Foley, “Axiomatic Design of equipment for analysis of SMA spring degradation during electronic actuation,” in *Complex Systems Engineering and Development Proceedings of the 27th CIRP Design Conference*, May 10–12, Procedia CIRP, Cranfield University, UK: Elsevier ScienceDirect, 2017, pp. 261–266
- B. F. Erlingsson, I. Hreimsson, P. I. Pálsson, S. J. Hjálmarsson, and J. T. Foley, “Axiomatic Design of a linear motion robotic claw with interchangeable grippers,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi’an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 213–218
- J. T. Foley, E. Puik, and D. S. Cochran, “Desirable complexity,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi’an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 101–106
- J. Guls, Ó. I. Bjarnason, Ó. Pétursson, S. Ö. Einarsson, and J. T. Foley, “Application of Axiomatic Design in designing autonomous underwater photography lighting,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi’an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 278–283
- K. Gerhard and J. T. Foley, “Redesign of the Suretrack grader transfer bin using Axiomatic Design,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi’an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 267–272
- F. Y. Ómarsdóttir, R. B. Ólafsson, and J. T. Foley, “The axiomatic design of chessmate: A chess-playing robot,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi’an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 213–236
- E. Puik, J. T. Foley, and D. Ceglarek, “Ignorance is bliss: Sudden appearance of previously unrecognized

- information and its effect,” in *10th International Conference on Axiomatic Design (ICAD)*, A. Liu, Ed., Sep. 21–23, Procedia CIRP, vol. 53, Xi'an, Shaanxi, China: Elsevier ScienceDirect, 2016, pp. 70–77
- J. T. Foley, “Evaluating Engineering Notebooks,” in *CDIO Annual International Conference*, June 12–16, Project in Progress, Turku, Finland, 2016
- J. T. Foley and S. Harðardóttir, “Creative Axiomatic Design,” in *26th CIRP Design Conference*, Jun. 15–17, Procedia CIRP, Stockholm, Sweden: Elsevier ScienceDirect, 2016, pp. 688–694
- D. S. Cochran, J. Li, K. Vanover, and J. T. Foley, “A System Design of a Rural Hospital Operating Room,” in *26th CIRP Design Conference*, Jun. 15–17, Procedia CIRP, Stockholm, Sweden: Elsevier ScienceDirect, 2016, pp. 597–603
- D. S. Cochran, J. T. Foley, and Z. Bi, “Use of the Manufacturing System Design Decomposition for Comparative Analysis and Effective Design of Production Systems,” *International Journal of Production Research*, vol. 55, pp. 870–890, 3 2016
- G. Bragason, S. Þorsteinsson, R. I. Karlsson, N. Grosse, and J. T. Foley, “Heat-activated parachute release system,” in *Proceedings of College International Pour La Recherche en Productique (CIRP), 9th International Conference on Axiomatic Design (ICAD)*, M. K. Thompson, A. Giorgetti, P. Citti, D. Matt, and N. P. Suh, Eds., Sep. 16–18, Procedia CIRP, vol. 34, Florence, Italy: Elsevier ScienceDirect, 2015, pp. 131–136. DOI: 10.1016/j.procir.2015.07.061. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S2212827115008203>
- B. L. Jónsson, G. Ö. Garðarsson, Ó. Pétursson, S. B. Hlynsson, and J. T. Foley, “Ultrasonic gasoline evaporation transducer — reduction of internal combustion engine fuel consumption using axiomatic design,” in *Proceedings of College International Pour La Recherche en Productique (CIRP), 9th International Conference on Axiomatic Design (ICAD)*, vol. 34, Florence, Italy, Sep. 2015, pp. 168–172. DOI: 10.1016/j.procir.2015.07.061. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S2212827115008203>
- G. Ó. Sölvason and J. T. Foley, “Low-cost spectrometer for icelandic chemistry education,” in *Proceedings of College International Pour La Recherche en Productique (CIRP), 9th International Conference on Axiomatic Design (ICAD)*, vol. 34, Florence, Italy, Sep. 2015, pp. 156–161. DOI: 10.1016/j.procir.2015.07.061. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S2212827115008203>
- M. K. Thompson and J. T. Foley, “Coupling and complexity in additive manufacturing processes,” in *8th International Conference on Axiomatic Design*, Lisbon, Portugal, Sep. 2014, pp. 177–182. [Online]. Available: <http://www.axiomaticdesign.com/technology/icad/icad2014/26-Thompson-et-al-paper.pdf>
- H. Gudmundsdottir, E. I. Ásgeirsson, M. H. Bodlaender, J. T. Foley, M. M. Halldórsson, and Y. Vigfusson, “Extending wireless algorithm design to arbitrary environments via metricity,” in *Proceedings of the 17th ACM international conference on Modeling, analysis and simulation of wireless and mobile systems (MSWiM)*, Montreal, Canada: ACM, Sep. 2014, pp. 275–284. DOI: 10.1145/2641798.2641811. [Online]. Available: <http://www.ymisr.com/papers/wireless-mswim.pdf>
- H. Gudmundsdottir, E. I. Ásgeirsson, M. H. Bodlaender, J. T. Foley, M. M. Halldórsson, and Y. Vigfusson, “Wireless scheduling algorithms in complex environments,” *arXiv preprint*, no. 1401.1723, Jan. 2014. [Online]. Available: <http://arxiv.org/pdf/1401.1723.pdf>
- J. T. Foley, “The sound of art and engineering colliding,” *Tölvumál*, vol. 1, no. 36, Dec. 2011. [Online]. Available: <http://www.sky.is/index.php/toelvumal/item/1581-the-sound-of-art-and-engineering-colliding>

M. Foley, R. Lieder, J. T. Foley, G. Örlygsson, and Ó. E. Sigurjónsson, “In vitro bioactivity of chitosan attached to titanium constructs using a novel electrophoretic deposition method,” in *Journal of Tissue Engineering and Regenerative Medicine*, Wiley-Blackwell, vol. 6, 111 RIVER ST, HOBOKEN 07030-5774, NJ USA, Sep. 2012, pp. 187–187

M. Foley, R. Lieder, J. T. Foley, G. Örlygsson, and Ó. E. Sigurjónsson, “Development of a novel electrophoretic deposition (EPD) method for coating titanium implants with chitosan,” Vienna, Austria, Sep. 2012

M. Foley, R. Lieder, J. T. Foley, G. Örlygsson, and Ó. E. Sigurjónsson, “Notkun á electrophoretic deposition aðferðum til húðunar á títanígræðum með kítósani,” 2012, 25 April – 4 May Poster session.

S. Kim, E. Hawkes, K. Cho, M. Jolda, J. T. Foley, and R. J. Wood, “Micro artificial muscle fiber using niti spring for soft robotics,” in *Intelligent Robots and Systems (IROS) 2009. IEEE/RSJ International Conference*, IEEE, St. Louis, MO: IEEE, Oct. 2009, pp. 2228–2234. DOI: 10.1109/IROS.2009.5354178

J. T. Foley and T. G. Gutowski, “Turbsim: Reliability-based wind turbine simulator,” in *IEEE International Symposium on Electronics and the Environment (ISEE)*, 2008, May 2008, pp. 1–5. DOI: 10.1109/ISEE.2008.4562872

D. Engels, J. T. Foley, J. Waldrop, S. Sarma, and D. Brock, “The networked physical world: An automated identification architecture,” in *IEEE Workshop on Internet Applications (WIAPP) 2001*, 2001, pp. 76–77

---

## Invited Talks and Presentations

- 2024 **AD in Everyday Things**, Joe Foley, IAAAD 2022 — International Association for the Advancement of Axiomatic Design Workshop, Free University of Bozen-Bolzano, South Tyrol, Italy, July 16–18
- 2023 **AD in Everyday Things**, Joe Foley, IAAAD 2022 — International Association for the Advancement of Axiomatic Design Workshop, Free University of Bozen-Bolzano, South Tyrol, Italy, July 11–13
- 2022 **AD in Everyday Things**, Joe Foley, IAAAD 2022 — International Association for the Advancement of Axiomatic Design Workshop, Free University of Bozen-Bolzano, South Tyrol, Italy, July 19–20
- 2018 **Axiomatic Design and Desirable Complexity**, Joe Foley, IWSSIP 2018 — 25th International Conference on Systems, Signals, and Image Processing, Maribor, Slovenia, June 20
- 2017 **Axiomatic Design for Everyone**, Joe Foley, International Conference on Axiomatic Design Tutorial, Iasi, Romania, September 11
- 2014 **Raspberry Pi: Affordable Embedded Linux**, Joe Foley, Félag rafeindavirkja (Icelandic Electronics Association) Keynote, Stórhöfði 29, Reykjavík 110, May 29
- 2013 **Introduction to Axiomatic Design**, Joe Foley, MPM Product Course Guest Lecturer, Reykjavík University, February 15
- 2012 **RU High Altitude Balloon Project**, Joe Foley, RU Lecture Marathon Series, Reykjavík University, March 23
- 2012 **RU High Altitude Balloon Project**, Joe Foley, Icelandic Rotary Club Guest Speaker, August 17
- 2012 **APRS Basics and Tracking**, Joe Foley, Icelandic Radio Amateur Club, Reykjavík, May 31
- 2011 **Digital Manufacturing and Personal Sustainability**, Joe Foley, Alþjóðlegi Umhverfisdagurinn (World Environment Day), Reykjavík University, June 5

- 2011 **Exploitable Assumptions**, *A. Brooks, E. Schmiedl, J. Foley*, DEFCON 2011
- 2007 **U.S.Industrial Energy Use: Making Less with More?**, *Jeffrey Dahmus, Alissa Jones, Lynette Cheah, Matthew Branham, Joseph Foley and Young Song*, MIT Energy Conference Poster Session, March 9 2007
- 2006 **Security Approaches for Radio Frequency Identification Systems**, *Dr. Joseph T. Foley*, EPCglobal US Conference, Los Angeles, October 19
- 2003 **Happy Trails: Automated Lifting Trailer**, *MIT 2.009 Team Purple '99*, Lemelson Inventor Conference, Washington DC, USA
- 2002 **AutoID Technology Demonstration**, *Distributed Information System Center MIT*, Cambridge University, UK

## Advising

- 2017–2022 **Robotics and Internet of Things Lab (previously: Lab for Unmanned Vehicles)**, *Joseph T. Foley*, Reykjavík University
- 2025 **ME Master's thesis advisor for Vilhjálmur Páll Thorarensen "Design of an in-line optical sensor module for microplastics contamination measurement"**, *Joseph T. Foley*, Reykjavík University, Expected completion June 2025
- 2024 **School of Energy Master's thesis advisor for Huldar Hlynsson "Design of a sail-assisted vessel for non-perishable cargo"**, *Joseph T. Foley and Bahadır Turkyilmaz*, Reykjavík University, Expected completion June 2025
- 2023 **ME Master's thesis advisor for Sindri Þór Harðarson "Adaption of a Game Physics Engine for and Industrial Digital Twin"**, *Joseph T. Foley*, Reykjavík University, Expected completion June 2025
- 2023 **School of Energy Master's thesis advisor for Alain Rene Frey "Design of an autonomous litter detection and collection system for Icelandic beaches"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis advisor for Steinarr Hrafn Höskuldsson "Design of a ground-deployed sensor for detecting the sag of Overhead Transmission Lines by measurement of the magnetic field"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis advisor for Gleny Milena Arias Huaman "Drone-based sampling device for microplastics in water in Iceland"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis advisor for Ignas Urbonas "Design of a robotic storage node: an efficiency analysis using Axiomatic Design"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis advisor for Jóannes Bergur Gunnarson "A design of a communication relay for Teledyne Gavia AUVs"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis co-advisor for Tómas Helgi Hjartarson "MPC for environmental control of a vertical farm"**, *Joseph T. Foley and Eliahu Augst*, Reykjavík University, Completed June 2023
- 2023 **ME Master's thesis advisor for Sindri Þór Jónsson "Self-adapting landing gear for multi-rotor drones"**, *Joseph T. Foley*, Reykjavík University, Completed June 2023
- 2023 **CS Batchelor's thesis advisor for Baldur Logi Gautason, Eva María Hönnudóttir Sigurþórsdóttir, Sölvi Karl Einarsson, and Unnar Freyr Arnþórsson. "Mars Rover analog<sup>2</sup>: a MESR analog with environmental mapping and simulation"**, *Marcel Kyas and Joseph T. Foley*, Reykjavík University, Completed June 2023

- 2022 **ME Master's thesis advisor for Rakel Hrönn Sveinsdóttir "Redesign of a cutting unit in a salmon gutting machine for cost and reliability"**, *Joseph T. Foley*, Reykjavík University, Completed June 2022
- 2021 **ME Master's thesis advisor for Danila Krapivenko "A universal prosthetic pump for lower limb amputees"**, *Joseph T. Foley*, Reykjavík University, Completed June 2021
- 2021 **ME Master's thesis advisor for Patrekur Smári Prastarson "International Pistol Training Tool — Competition Shooting Device"**, *Joseph T. Foley*, Reykjavík University, Completed June 2021
- 2018 **ME Master's thesis advisor for Sævar Örn Einarsson "Development of a Dynamic Multi-Belt Scale for IQF sorting"**, *Joseph T. Foley*, Reykjavík University, Completed June 2019
- 2018 **MSc. Master's thesis advisor for Shahab Ali Shah "Using the Collective System Design Approach to Facilitate Sustainable Manufacturing"**, *David S. Cochran, Todor Cooklev, Behin Elahi, Joseph Timothy Foley*, Purdue Fort Wayne and Reykjavík University, Completed June 2019
- 2018 **EE Master's thesis advisor for Einar Pétursson "Low-power recovery system for patients with dementia"**, *Marcel Kyas and Joseph T. Foley*, Reykjavík University, Completed: January 2019
- 2017 **ME Master's thesis advisor for Vladimir Omelianov "Automated 3-axis multi-Ghz antenna testing unit"**, *Joe Foley and Slawomir Koziel*, Reykjavík University, Completed January 2018
- 2017 **ME Master's thesis advisor for Nicholas Randall "Improving power-grid stability with real-time analysis of PMU data"**, *Joe Foley and Ragnar Kristjansson*, Reykjavík University, Completed September 2017
- 2016 **ME Bachelors's thesis advisor for Sævar Örn Einarsson "Shape Memory Alloy resistive heating degradation analysis"**, *Joe Foley*, Reykjavík University, Completed June 2016
- 2016 **ME Master's thesis advisor for Krisján Gerhard "Redesign of the SureTrack Grader Transfer Bin Using Axiomatic Design Theory"**, *Joe Foley*, Reykjavík University, Completed January 2016
- 2016 **EE Bachelor's thesis evaluator for Borys Niekurzak "Yaw angle measurement using inertial measurement unit"**, *Advisor: Baldur Þorgilsson, Evaluator: Joe Foley*, Reykjavík University
- 2015 **ME Master's thesis advisor for Gunnar Óli Sölvason "Low cost spectrometer for Icelandic chemistry education"**, *Joe Foley*, Reykjavík University, Completed June 2015
- 2015 **ME Master's thesis advisor for Eiður Örn Þórsson "Dust Maker: a Volcanic Ash Dispersion Unit"**, *Joe Foley & Þorgeir Palsson*, Reykjavík University, Expected completion June 2015
- 2015 **ME Master's thesis advisor for Sigurður Ingi Einarsson "Cabin Air Flow in Icelandair Boeing 757–200 Airplanes"**, *Joe Foley & Þorgeir Palsson*, Reykjavík University/Icelandair Technical Services, Expected completion June 2015
- 2014 **EE Batchelor's thesis advisor for Sigríður Árný Júlíusdóttir "Movement measurement device for airplanes"**, *Joe Foley*, Reykjavík University/Icelandair Technical Services, Completed May 2014
- 2013 **Independant Study for Björgvin Rúnar Þórhallsson "DustLoop" for T-870-INTE Integrated Project**, *Joe Foley & Þorgeir Palsson*, Reykjavík University/University of Iceland, Completed August 2013

- 2013 **CS Master's thesis advisor for Georgios Petropoulos "Automated Flight Data Bus Testing System" (working title)**, *Joe Foley & Þorgeir Þalsson*, Reykjavík University/Icelandair Technical Services hosting for University of Camerino, Italy, Completed June 2015
- 2012 **Independant study for Guðmundur Viktorsson "Development of a Flight Data Acquisition and Converter System"**, *Joe Foley & Þorgeir Þalsson*, Reykjavík University and Icelandair Technical Services
- 2012 **Master's thesis evaluator for Guðjón Hugberg Björnsson "Automatic thermal inspection of aluminum reduction cell"**, *Evaluators: Joe Foley, Jón Guðnason, Agni Asgeirsson*, Reykjavík University

## Referee

- 2023 **Chloey Schaff Master's in Computer Science Thesis "A foundation for autonomous conceptual engineering design"**, *Examiner*, Reykjavík University, Iceland
- 2018 **International Conference on Axiomatic Design 12 (ICAD2018)**, *Head Organizer, Scientific Chair, Editor*, Reykjavík, Iceland
- 2017 **International Conference on Axiomatic Design 11 (ICAD2017)**, *Scientific Chair*, Iasi, Romania
- 2017 **27th CIRP Design Conference**, *Session Chair*, Cranfield University, UK
- 2016 **International Conference on Axiomatic Design 10 (ICAD2016)**, *Reviewer*, Xi'an, Shaanxi, China
- 2016 **CDIO Annual International Conference**, *Session Chair*, Turku, Finland
- 2016–2017 **International Journal of Production Research**, *Reviewer*
- 2016 **Journal of Engineering Design**, *Reviewer*
- 2016 **International Journal of Numerical Modelling: Electronic Networks, Devices and Fields**, *Reviewer*
- 2015 **International Conference on Axiomatic Design 9 (ICAD2015)**, *Reviewer*, Florence, Italy
- 2014 **ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA2014)**, *External reviewer*, Copenhagen, Denmark
- 2003 **IEEE Workshop on Pervasive Computing and Communication Security (PerSec)**, *External reviewer*, Fort Worth, Texas

## Intellectual Property

- 2017 **Portable escape-room media platform**, *Joe Foley and Vladimir Omelianov*  
Raspberri pi based media display system for interfacing with "escape room" type games. Developed for Escape Reykjavík.
- 2014 **iPad Video Control**, *Joe Foley*  
Modular cgi-based iPad Video control system for use with Raspberry Pi. Developed for the Reykjavík Art Museum, Icelandic National Gallery, and Listasafn Árnesinga
- 2013 **DVD and Blue-ray Art Installation Synchronizer**, *Joe Foley*  
Arduino system for video synchronization. Developed for the Reykjavík Art Museum
- 2013 **US Patent 8,384,546 "Tag Anti-Countefeit Systems"**, *Joseph T. Foley, Sanjay E. Sarma, and Steve Weis*
- 2011 **US Patent 20110083325 A "Method of Manufacturing a Nickel Titanium Coil Actuator"**, *M. Jolda and J. Foley*, *iRobot Patent*
- 2011 **Google Code "arduino-roomba"**, *Joe Foley*  
Library for interfacing an Arduino and iRobot Create/Roomba. GPL2.

- 2000 **US Patent 7,765,253 “Object Name Service”**, *Joseph Foley, Erik Nygren, & Sanjay Sarma.*  
*MIT TLO 9789*

---

## Collaboration

- 2024 **“PANTHER: PAN and Trace Hydrohalocarbon Experiment”**, *PI: Gregor Steinbrugge*, University of Colorado Boulder-NASA JPL  
Demonstration of a SDR module capable of passive ground-penetrating radar in the search for water precursors in the Icelandic highlands
- 2021–2022 **“RAVEN: Rover-Aerial Vehicle Exploration Network”**, *Marcel Kyas and Joseph T. Foley*, Reykjavík University and University of Arizona, College of Science, Lunar & Planetary Laboratory  
NASA Funded study of ground and aerial robots working together to navigate, explore, and collect geological data.
- 2022 **Sums & Differences Art Exhibition**, *Joseph T. Foley and Kristín Shieving*, Reykjavík University and Listasafn Árnesinga, Hveragerði, Iceland.  
Dual-synchronized screen video for Gary Hill’s “Sine Wave” and 3 tablet-controlled video installation systems for Gary Hill, Steina Vasulka, and Woody Vasulka’s works.
- 2019–2021 **“SAND-E: Semi-Autonomous Navigation for Detrital Environments”**, *Joseph T. Foley and students of Independant Study 2019*, Reykjavík University and Mission Space Control, Inc.  
NASA-funded project to study volcanic sand environments in Iceland as an analog to Mars
- 2021 **“CHILL-ICE Analogue Mission”**, *Advisor for Aron Ingi Sverrisson and Bjarki Laxdal Baldursson*, Reykjavík University, TU Delft, KPU, and more  
Developed communication system for mission: construction of a Habitat inside a Lunar-analogue Lava-tube
- 2018 **“Huglæg rými” aka. “Subjective Spaces” Video Art Installation**, *Ólafur Sveinn Gíslason, Inga Jónsdóttir, and Joseph T. Foley*, Reykjavík University and Listasafn Árnesinga, Hveragerði, Iceland  
2 pairs of dual-screen synchronized video players deployed in the info-beamer hosted framework.
- 2018 **“Hver-gerði” Interactive Art Installation**, *Sigrún Harðardóttir and Joseph T. Foley*, Reykjavík University and Listasafn Árnesinga, Hveragerði, Iceland  
Adafruit Feather LoRA based interactive furniture, room, and instrument system.
- 2016– **Mjolnir 2 rocket launch project**, *Launch designer with Anders Holmqvist*, Reykjavík University and Thorildsplan Gymnasium, Stockholm, Sweden  
Developing a liquid-fuel rocket platform for high altitude launch in Iceland.
- 2011–2014 **RU-LHÍ Music, Art, Software, Engineering Collaboration**, *RU Lead*, Reykjavík University and Listaháskolinn Islands  
Co-teaching T-428-EMIR, Gagnvirk rafvélræn list “Electromechanical Interactive Art” with faculty in RU Computer Science, LHÍ Music, and LHÍ Visual Arts. This class will create teams of engineers, programmers, musicians, and visual artists to create collaborative inter-disciplinary interactive art.
- 2011 **“Emerging and Imposing Spaces” (“Vaxandi og uppþrengjandi rými”)**, *co-organized with Sigrún Harðardóttir*, RU and LHÍ, Electro-mechanical Interactive Art  
Visual Arts class “Interactivity” LHÍ & RU VT HUN1013 “Design” cooperated to produce 7 unique art installation works shown at LHÍ. Selected pieces shown at Hreindirland Festival 2011 and covered by RÚV 2.
- 2010–2016 **Hakkavélin**, *faculty advisor*, Hackspace
- 2003–2004 **Internet Engineering Task Force (IETF) ONS Working Group**, *founding member*, AutoID Center MIT, Verisign, & EPC Global
- 2005 **ONS 1.0**, *architect*, AutoID Center MIT & OATsystems

---

## Teaching

- Spring 2021– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Current T-620-ENGX “EngineeringX”
- Fall 2011– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Current T-865-MADE “Precision Machine Design”
- Fall 2011– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Current T-411-MECH “Mechatronics 1”
- Fall 2015– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Fall 2016 T-100-HUGM “Brainstorming”
- Fall 2015– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Fall 2018 T-116-VERK and T-102-VERK “Intro to Engineering”
- Spring 2012 & **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
2014 T-428-EMIR “Electro Mechanical Interactive Art”
- Fall 2012– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Fall 2013 T-100-AFVV “Project Work Methods”
- Spring 2010– **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland, Joint course with Iceland Academy  
Spring 2020 of the Arts  
VT HUN1013 “Design”
- Spring 2014 **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
T-820-INTE “Integrated Project”: Master’s class performed 2 high-altitude rocket launches (2+ km).  
See collaboration section for info on T-420-EMIR.
- Fall 2012 **Lecturer**, *Reykjavik University*, Reykjavík 101, Iceland  
Lab instructor for T-722-WNMO “Wireless Networks and Mobility”.
- 2011–2013 **Advisor/Consultant**, *Icelandair Technical Services, Design Department*, Building 8, 235  
Keflavik Airport, Iceland  
Designing and prototyping ATmega/Arduino avionics interface to convert and filter data between A757 and A429 data buses. This interface will allow real-time monitoring of flight data, with particular focus on the accelerometer inputs. Co-advising bachelor’s student Guðmundur Viktorsson in this project with Þorgeir Pállson of RU.
- Spring 2006 **Teaching Assistant**, *CSCI-E-170: Computer Security and Privacy*, Harvard Extension  
School, Cambridge, MA  
Lectures, problem set generation, and grading on security material.
- 2002–2005 **Head Instructor**, *MIT Faculty Pistol & Rifle Club*, Cambridge, MA  
Revised NRA pistol safety curriculum to integrate international target pistol trends. Taught Marksmanship and Pistol Safety course every semester.
- Fall 1999 **Teaching Assistant**, *MIT 2.007 Introduction to Mechanical Design*, Cambridge, MA  
Revised curriculum, developed control system and scoring system for “Ballcano” robotics competition.

## Grants

- 2024 **Advisor**, *RU Sustainability Institute Project Grant*, Menntavegur 1, Reykjavík 101, Iceland  
Grant: 1 000 000 ISK “Rapid assessment of microplastic contamination in Icelandic water bodies” by Joseph T. Foley, Marcel Kyas, and Sydney Fox
- 2023 **Advisor**, *RU Sustainability Institute Project Grant*, Menntavegur 1, Reykjavík 101, Iceland  
Grant: 1 000 000 ISK “Verification of an innovative drone technique to analyze water pollution” by Joseph T. Foley and Sydney Fox
- 2022 **Advisor**, *RU Sustainability Institute Project Grant*, Menntavegur 1, Reykjavík 101, Iceland  
Grant: 1 000 000 ISK “Drone-based water sampler for micro-plastics research” by Joseph T. Foley and Sydney Fox

- June 2021– **Advisor**, *Student Innovation Fund*, Menntavegur 1, Reykjavík 101, Iceland
- August 2021 Grant: 3 000 000 ISK for DUFL “Áreiðanlegur staðsetningarbúnaður úti á sjó” i.e. enhanced bouy tracking system by Leif Halldór Arason, Þorsteinn Geirsson, Eyjólfur Emil Jóhannesson, Haukur Ingi Valdermarsson, and Joseph T. Foley
- June 2021– **Advisor**, *Iceland Summer Student Fund*, Menntavegur 1, Reykjavík 101, Iceland
- August 2021 Grants: Integrate Robot Operating System and Python into Mechatronics teaching; Implement convolutional neural networking for MARS feature recognition; Airborn sensor deployment
- June 2020– **Advisor**, *Iceland Summer Student Fund*, Menntavegur 1, Reykjavík 101, Iceland
- August 2020 Grant: Lab Designers to re-design Mechatronics 1 to be more suitable during COVID-19
- Sept 2014– **Advisor**, *Icelandair Group Research Fund*, Menntavegur 1, Reykjavík 101, Iceland
- Jan 2014 Grant: Cabin Air Flow in Icelandair Boeing 757–200 Airplanes by Joseph T. Foley and Þorgeir Pálsson
- Sept 2012– **Advisor**, *RANNIS Technology Fund (Tækjinniróunarsjóður)*, Menntavegur 1, Reykjavík 101, Iceland
- Jan 2013 Grant: Automated Pinbone Removal in Cod and Whitefish (APRICOT). PI: Kristinn Andersen (Marel)
- June 2011– **Advisor**, *RANNIS Student Innovation Fund (Nýsköpunarsjóður námsmanna)*, Menntavegur 1, Reykjavík 101, Iceland
- Sept 2011 Grant: “CNC foam-cutter for micro air vehicle wings” for student research salary during summer. Advised software and mechanical undergraduates in the design and construction of a high-precision, low-cost computer-controlled (CNC) hot-wire foam cutter for the prototyping of small-scale foam-composite aircraft wings. Materials funded from RANNIS “Flapping-wing Unmanned Air Vehicle”.

## Experience

- 2018– **Assistant Professor**, *Reykjavík University School of Technology, Department of Engineering*, Menntavegur 1, Reykjavík 102, Iceland
- Current Teaching and researching mechatronics devices, focusing on avionics and wireless. Product and Axiomatic Design is a common technique used in all of these fields.
- 2013–2018 **Assistant Professor**, *Reykjavík University Science and Engineering*, Menntavegur 1, Reykjavík 101, Iceland
- Teaching and researching mechatronics devices, focusing on avionics and wireless. Axiomatic Design is a common technique used in all of these fields.
- 2013–2014 **IT Researcher**, *Reykjavík University UTS*, Menntavegur 1, Reykjavík 101, Iceland
- Researching into file/media servers, better help-desk experience, collaboration tools, and DNS management.
- 2012– **Research Engineer**, *MIT Laboratory for Manufacturing and Productivity: Distributed Quality Control Project*, 77 Massachusetts Ave, Cambridge MA
- Sept 2012 Researching automation technology on NIST manufacturing grant on decentralized manufacturing and quality control practices. PI: Sanjay Sarma
- 2010–2012 **Specialist**, *Reykjavík University Science and Engineering*, Menntavegur 1, Reykjavík 101, Iceland
- Research into simplified robotics infrastructure to solve sensing problems and improve rapid prototyping capabilities. Also developing cross-discipline programs and classes with Iceland Academy of the Arts (LHI)
- June 2011– **Consultant**, *3Z ehf.*, Menntavegur 1, Reykjavík 101, Iceland
- Sept 2011 Designed and implemented prototype zebrafish embryo dispensing robot for pharmacology and toxicity studies.
- Sept 2010– **Consultant**, *Brass Drift, Inc.*, Emeryville, CA
- March 2011 Designed custom low-cost flexure locking mechanism for an electronic security box.
- Sept 2010– **Consultant**, *MIT Biomimetic Robotics Lab*, Cambridge, MA USA & Reykjavík, Iceland
- Jan 2011 Finite element analysis of advanced structural composites used to develop a high speed quadruped robot for Professor Sangbae Kim.

- Nov 2007– **Senior Research Scientist**, *iRobot G & I Research*, Bedford, MA
- Aug 2010 Designing new robotics concepts and mechanisms in the DARPA ChemBots program. iRobot research & development in government and industrial applications/proposals.
- Nov 2006– **PostDoctoral Research Associate**, *MIT*, Cambridge, MA
- Nov 2007 “Energy Efficiency in Manufacturing” Investigated energy usage in the manufacturing industries and created wind turbine reliability simulator.
- 2004– **Web software engineer**, *SigMantra LLC*, Bedford, MA
- March 2004 Developed social-media website “Uffinity” for connecting recently graduated young-professionals to others offering employment.
- May 2000– **Magic Mechanic**, *Emode, Inc.*, Cambridge, MA
- Sept 2000 Developed world’s largest fully-indexed quote database. Developed and installed network security policies and equipment
- May 1997– **Mechanical Design Engineer**, *Brute Force Games*, Cambridge, MA
- Sept 1997 Designed full immersion game simulator platform leveraging vection research.
- Sept 1996– **Network Programmer**, *MIT Network Operations*, Cambridge, MA
- Sept 1999 Security operations and emergency paging system development.
- July 1994– **Network Administrator**, *Brooks Automation*, Lowell, MA
- Sept 1994 Installation and configuration of network infrastructure, development of automated FAX document server.
- July 1993– **Intern**, *Solar Cell Lab, University of Massachusetts*, Lowell, MA
- Sept 1993 Programming of HPGIB-based electrical analyzer for solar cell efficiency

## Pending, Unpublished, and Project Works, available upon request

### Educational Research

- 2022 **Embracing Failure as an Integral Aspect of Engineering Education**, *Joseph T. Foley and Ágúst Vafells*, CDIO2022 Project in Progress

### Mechanical Design

- 2018 **PLASBAR: Heat-activated Parachute Release System**, *J. Foley, H. Gunnarson, T. Semmler, O. Vasques, J. Holfelder, M. Ariaudo, M. Jafri, D. Cochran*
- 2011 **Low-cost high-accuracy spectroscope**, *Arnar Þ. Stefánsson, Elin A. Steinarsdottir, Guðjón H. Björnsson, Matthías Stefánsson, Máni Ólafsson, Ólöf K. Hrafnisdóttir, and Joe Foley*  
<http://afs.rnd.ru.is/course/T-865-MADE/2011/Projects/Spectrometer/Documentation/Report/report.pdf>
- 2011 **Bio-tensegrity: A New Design Paradigm for Hyperdynamic Legged Robots**, *A. Ananthanarayanan, J. Foley, and S. Kim*
- 2001 **Wireless Friends: Company Business Plan**, *Sofy Tarud, Joe Foley, Oscar Lopez, Omri Pedatzur*
- 2000 **System Analysis and Design of the Insight M3/M5 Tactical Illuminator**, *Vince E. Carballo, Miguel A. Chavez, Joe Foley*
- 1998 **Low-Cost Pine Car Derby Timing System**, *Joe Foley*, Advanced Undergraduate Project, Advisor: Professor Alex Slocum

### Software Engineering

- 2001 **Automotive Diagnosis Assistant**, *Joe Foley, Ariel Segall*
- 1999 **Kraken: Distributed Cooperative Web Caching**, *Joe Foley, Amy Vandiver, & Ben Vandiver*
- 1998 **Evolved PacMan: Genetic Algorithm for Design of Control Systems**, *Joe Foley & Mike Phillips*
- 1996 **An Ad-Hoc FPGA — Xilinx Type**, *Joe Foley & Mark Roh*
- 1996 **A Partly Read-Only, Portable Web Site**, *Joe Foley*

## Security

- 2006 **ONS Deployment and Visibility Challenges**, *Dan Engles and Joe Foley*  
2004 **Flingetty: Secure Multiparty Computation for a Dating Match-Up System**, *Natan Cliffer, Joe Foley, Hongyi Hu*  
2003 **KLite: A RFID Tag Anti-Counterfeit System**, *Joe Foley*  
2003 **EPC Reductionism**, *Joe Foley*  
1996 **WhoRU: Anonymous Encrypted Remailer**, *Daniel Derksen, Joe Foley, Matthew Rimer*

## Miscellaneous

- 1998 **Cambridge Heart**, *Joe Foley, Marc Lebovitz, Ranjini Srikantiah, Victor Su*

## Languages

|           |        |                                   |
|-----------|--------|-----------------------------------|
| English   | Native |                                   |
| Spanish   | Novice | High School education, 1990–1994  |
| Chinese   | Novice | MIT 2005                          |
| Icelandic | Novice | RU Islenska fyrir Útlendingur 1–3 |

## Skills

|             |                                                              |                   |                                             |
|-------------|--------------------------------------------------------------|-------------------|---------------------------------------------|
| programming | Rust, C/C++, Java                                            | scripting         | PHP, Bash, python, perl                     |
| scientific  | Matlab, Maple                                                | Modeling          | Creo, SolidWorks, Inventor                  |
| simulation  | AutoDesk SimulateCFD                                         | typography        | L <sup>A</sup> T <sub>E</sub> X, PostScript |
| control     | Arduino/Atmega, Raspberry Pi, Beagle-Bone, PIC               | Rapid prototyping | FDM, Laser templates, silicone molding      |
| OS          | Linux, UNIX, Windows, OSX                                    | administration    | Apache, DNS, ONS                            |
| web design  | PostNuke, Turbogears                                         | database          | MySQL, PostgreSQL                           |
| EEA         | IS Explosives certification (class B), Amateur Radio License | SCUBA             | PADI Rescue Diver, Dry Suit, Nitrox         |