

# ALEX HAGEN

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Portfolio - [alexhagen.github.io](https://alexhagen.github.io)

## EDUCATION

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Jan. 2009 - Present Purdue University

*Doctorate of Philosophy in Nuclear Engineering, Final Defense in December 2017*

*Master of Science in Nuclear Engineering, August 2014*

*Concentration in Computational Science and Engineering*

*Bachelor of Science in Nuclear Engineering, May 2012*

## RESEARCH POSITIONS

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May 2012 - Present Graduate Researcher - Metastable Fluid Research Laboratory

- ⇒ Worked towards interdiction and detection of smuggled special nuclear material at borders
- ⇒ Improved efficacy of Tensioned Metastable Fluid Detectors for use in active interrogation schemes under DNDO grant
- ⇒ Developed validation method and multiphysics simulation of Acoustically Tensioned Metastable Fluid Detector systems
- ⇒ Designed and characterized Centrifugally Tensioned Metastable Fluid Detector system

May 2011 - Aug. 2011 Undergraduate Laboratory Intern - Argonne National Laboratory Nuclear Engineering Division

- ⇒ Validated multiphysics fission reactor simulation against legacy neutronics codes and experimental data
- ⇒ Supported team simulating and developing next generation fast fission reactors

## INDUSTRIAL EXPERIENCE

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Jan. 2009 - Jan. 2011 Industrial Design Assistant - Steiner Enterprises

- ⇒ Designed, drafted, and prototyped as part of a small product design team in the educational products industry
- ⇒ Developed 6 products from concept to production - including rotational physics instructional kit, electrophoresis chambers, and a Van de Graaf generator
- ⇒ Sourced, revised, or formalized the machine drawings and designs of over 30 other products

## SELECTED PUBLICATIONS AND CONFERENCE PRESENTATIONS

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- ⇒ **A. Hagen**, B. Archambault, and R. Taleyarkhan. "Detection of Special Nuclear Material in Cargo using Continuous Neutron Interrogation and Tension Metastable Fluid Detectors." In: *ANS Winter Meeting and Nuclear Technology Expo*. Las Vegas, NV: American Nuclear Society, 2016
- ⇒ B. Archambault, **A. Hagen**, K. Masuda, N. Yamakawa, and R. P. Taleyarkhan. "Threshold Rejection Mode Active Interrogation of SNMs Using Continuous Beam DD Neutrons with Centrifugal and Acoustic Tensioned Metastable Fluid Detectors." In: *IEEE Transactions on Nuclear Science* (2016), pp. 1-1
- ⇒ **A. Hagen**, T. F. Grimes, B. C. Archambault, T. N. Harris, and R. P. Taleyarkhan. "Characterization and Optimization of a Tensioned Metastable Fluid Nuclear Particle Sensor Using Laser Based Profilometry." In: *Journal of Nuclear Engineering and Radiation Science* 1.4 (Sept. 2015), p. 041004
- ⇒ **A. Hagen**, T. F. Grimes, B. C. Archambault, T. N. Harris, and R. P. Taleyarkhan. "Characterization and Optimization of a Tensioned Metastable Fluid Nuclear Particle Sensor Using Laser Based Profilometry." In: *Proceedings of the International Conference on Nuclear Engineering*. Prague, Czech Republic: ASME, July 2014, V005T17A036

## PATENTS

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- ⇒ R. P. Taleyarkhan, A. C. Bakken, K. F. Fisher, **A. Hagen**, and N. P. Kostry. *WO2014078720 A1: Polylactic acid adhesive compositions and methods for their preparation and use*. 2014

## HONORS AND AWARDS

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- May 2017* Department of Energy Innovation in Nuclear Technology R&D Award
- Nov. 2016* ANS Young Member's Group Best Paper Award
- Oct. 2016* IEEE Sensors Conference Demonstration 1st Prize
- Apr. 2016* Purdue Engineering Outstanding Service Award
- July 2014* Received Best Poster Award and Best Paper Award at International Conference on Nuclear Engineering 22
- Apr. 2007* National Merit Scholarship
- Apr. 2006, Apr. 2007* Two Time Delegate to Intel International Science and Engineering Fair

## LEADERSHIP ROLES

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- Aug. 2012 - May 2017* President of NEGO (Nuclear Engineering Graduate Organization)
- Aug. 2014 - May 2016* Chair of Purdue Graduate Student Government (PGSG) Advancement Committee
- Aug. 2013 - May 2016* Senator representing Nuclear Engineering to PGSG
- May 2011 - May 2012* President and Captain of Purdue Men's Club Soccer

## SKILLS

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