Date: July 2021

COLLEGE OF ENGINEERING

Faculty Activities Summary

Name: Gary E. Christensen University No: 00084101

Academic Rank and Date Appointed (Mo/Yr): Professor, July 2010

Date of First University of Iowa Appointment (Mo/Yr): January 1997

Department(s): Electrical and Computer Engineering

Office Address: 4324 S.C. Office Phone: 319-335-6055

Home Address: 1352 Wild Prairie Drive Home Phone: 319-621-3574

 Iowa City, IA 52246

Birthplace & Date (Optional): St. Louis, Missouri, 12/24/65

Spouse's Name, if Applicable (Optional): Shannon M. Christensen

Highest Academic Degree: Doctorate of Science

Special Fields of Knowledge: Image Registration, Probability, Stochastic Processes, Image & Signal Processing, Medical Imaging, VLSI Design, Parallel Programming

Present Research Interests: Computational Anatomy, Global Shape Models, Medical Imaging

Present Course Teaching Preferences:

(List courses by course number and title in descending order of teaching preference)

Program Courses (List at least five)

1. ECE:5460 Digital Signal Processing
2. ECE:2400 Linear Systems I
3. ECE:3400 Linear Systems II
4. ECE:3330 Software Design
5. ECE:5480 Digital Image Processing
6. ECE:7480 Advanced Digital Image Processing

Core Courses (List at least two)

1. ENGR:2730 Computers in Engineering
2. ENGR:1300 Introduction to Engineering Computing
3. ENGR:2120 Electrical Circuits

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NOTE: THIS PAGE IS LIMITED TO THE INFORMATION REQUESTED AND THAT

INFORMATION IS LIMITED TO THE SPACE PROVIDED.

The University of Iowa, College of Engineering requests this information on the credentials and accomplishments of faculty for collegiate purposes including consideration for reappointment, promotion, and merit salary adjustments. No persons outside the University are routinely provided this information. Information you fail to provide will result in an incomplete record of your credentials and accomplishments. Responses to items marked "optional" are optional.

1. Academic Background

Institution Dates Attended Major Degree Date Awarded

Washington Univ. 1984-1988 E.E. B.S. 1988

Washington Univ. 1984-1988 C.S. B.S. 1988

Washington Univ. 1988-1989 E.E. M.S. 1989

Washington Univ. 1990-1994 E.E. D.Sc. 1994

2. Professional Experience

 2.1 Academic

|  |  |  |  |
| --- | --- | --- | --- |
| University | Position | Dates | Main Courses Taught |
| Washington Univ. | Comp. Prog. at the Biomedical Computer Lab. | 1987-1988 |  |
| Washington Univ. | Res. Asst. under R. Morley | 1988-1989 |  |
| Washington Univ. | Res. Asst. at the Biomedical Computer Lab. | 1990-1991 |  |
| Washington Univ. | Res. Asst. under M.I. Miller | 1991-1994 |  |
| Washington Univ. | Res. Asst. Prof. Surgery | 1994-1996 |  |
| Washington Univ. | Res. Asst. Prof. Radiology | 1994-1996 |  |
| Washington Univ. | Asst. Prof. of Surgery | 1996-1997 |  |
| Washington Univ. | Asst. Prof. of Radiology | 1996-1997 |  |
| Washington Univ. | Affiliate Asst. Prof. of EE | 1996-1997 |  |
| Washington Univ. | Director of Craniofacial | 1994-1997 |  |
| The Univ. of Iowa | Assistant Prof. of ECE | 1997-2003 | Signal & Image Proc., Circuits |
| The Univ. of Iowa | Associate Prof. of Radiation Oncology | 2006-2010 |  |
| The Univ. of Iowa | Associate Prof. of ECE | 2003-2010 | Signal & Image Proc., Computers, Circuits |
| The Univ. of Iowa | Prof. of Radiation Oncology | 2010-present |  |
| The Univ. of Iowa | Prof. of ECE | 2010-present | Software Engineering |
| The Univ. of Iowa | ECE Undergraduate Coordinator | 2017-present |  |

 2.2 Industrial

 Company Position Dates\_\_\_\_\_\_

 None

 2.3 Other

 Company, Firm, Agency Position Dates\_\_\_\_\_\_

 None

3. Professional Activities

 3.1 Scientific and Professional Societies

 (Give grade of membership. List committee memberships, chairmanships, or offices held with inclusive dates.)

 IEEE – Fellow (2018)

 SPIE – Lifetime Member

 3.2 Professional Registration (Give states in which registered)

 None

 3.3 Honors, Prizes, and Awards (Provide year of award)

1. Jia Xu, et al., International Society for Bipolar Disorders (ISBD) 2020 best poster award.
2. PhD student award: Yue (Amanda) Pan, Ada Louise Ballard and Seashore Dissertation Fellowship, Spring 2020.
3. PhD student award: Wei Shao, Ada Louise Ballard and Seashore Dissertation Fellowship, Spring 2019.
4. 2018-2019 Graduate College Outstanding Faculty Mentor Award – Mathematical, Physical Sciences & Engineering – Honorable Mention.
5. 1st and 3rd place out of 23 international submissions in the Computed Tomography Ventilation Imaging Evaluation 2019 (CTVIE19) Grand Challenge at the American Association of Physicists in Medicine (AAPM) 2019 annual meeting.
6. Elevated to IEEE Fellow for contributions to medical image registration and analysis, Class of 2018
7. Recognized by the Graduating Class of 2013 for making a positive impression in their lives.
8. 2012 Spring semester award for the most helpful professor in the College of Engineering, Chi Omega Sorority.
9. 2008 Award for Outstanding Achievement in Teaching, College of Engineering, The University of Iowa.
10. 1st place Seimens 2007 Preclinical CT Image of the Year for “Imaging and analysis for the assessment of the normal mouse lung,” acquired by Eric A. Hoffman, Geoffrey McLennan, Joseph M. Reinhardt, Gary E. Christensen, Deokiee Chon, Eman Namati, Jacqueline Namati, Lijun Shi, Joo Hyun Song, Kunlin Cao, and Jered Sieren from the University of Iowa.
11. 2004-2007, The Robert and Virginia Wheeler Faculty Fellow of Engineering
12. 1/05 – 6/05, Obermann Scholar
13. 1997-2001 Whitaker Foundation Young Investigator.
14. 1995 Ebbsman Prize Honorable Mention, XIVth International Conference on Information Processing in Medical Imaging, Brest, France.
15. 1988 Outstanding Senior, Electrical Engineering Dept., Washington Univ.
16. 1988 Academic Excellence Award, Computer Science Dept., Washington Univ.
17. 1988 Graduated Magna Cum Laude in Electrical Engineering, Washington Univ.
18. 1988 Graduated Magna Cum Laude in Computer Science, Washington Univ.
19. 1984-1988 Robert W. Otto Scholarship.
20. 1984 First Place Overall, St. Louis Science Fair and Third Place in Physics at the International Science and Engineering Fair.

 3.4 Consulting (Provide inclusive years)

 Surgical Navigation Technologies - 1995-1996

 IntellX - 1996-1998

 3.5 Other

 None

4. Service Activities

(Include activities of last two years and indicate scope of involvement and responsibility, i.e.,

committee member, chairman, etc. Provide inclusive dates for activities.)

 4.1 Department

9/10 – present ECE Scholarship Committee, Chairman

1/17 – present ECE Undergraduate Committee

5/19 – 4/20 ECE Instructor Search Committee

5/19 – 9/19 Master of Science in Engineering and Information Technology (MSEIT) Committee

9/16 – 4/17 ECE Search Committee Chair, Informatics Cluster Hire (IoT)

9/13 – 12/16 ECE Graduate Committee

9/13 – 3/14 ECE Search Committee for Big Data Line

9/13 – 12/13 ECE Ad-Hoc Grad Committee

8/12 – 7/13 ECE Undergraduate Committee

4/12 – 8/12 ECE Undergraduate Committee – ad hoc member

9/10 – 5/11 ECE/ME CIE Restructuring Committee

9/10 – 3/11 ECE/Radiology Aging Cluster Hire Search Committee

9/10 – 10/10 ECE/Radiology Joint DCG Committee

9/09 – 5/10 ECE Graduate Committee

9/09 – 10/09 ECE/Radiation Oncology Joint DCG Committee

9/04 – 5/09, ECE ABET Committee

9/04 – 5/09, ECE Undergraduate Committee

10/07 – 5/10, Help maintain the ECE web site

8/00 – 10/07, ECE Department web site designer and Webmaster

5/06 – 5/08, ECE DEO search Committee

1/04 – 5/06, ECE/Medical School Recruitment Committee

1/04 – 5/04, ECE-BME Medical Imaging Curriculum Committee.

1/03 – 5/04, ECE Undergraduate Recruitment Director

9/03 – 5/04, Chairman, ECE Undergraduate Committee

1/02 – 5/02, ECE Laboratory Committee

9/98 – 12/99, 9/01 – 5/02, ECE Secretary

9/00 – 12/00, ECE Self-Study Committee

9/97 – 5/00, ECE Graduate Committee

9/98 – 5/99, ECE Faculty Recruitment Committee

 4.2 College

8/19 – present College of Engineering Research Advisory Committee (Associate Dean of Research Advisory Board)

12/21 – present College of Engineering Director of Undergraduate Studies Committee

1/06 – present Explore Engineering Day presenter.

5/98 – present College of Engineering Parent Orientation presenter.

9/18 – 4/19 Introduction to Engineering Computers (IEC) ad hoc committee

9/13 – 12/16 College of Engineering Promotion and Tenure Policy Committee (Chair 9/15 – 12/16)

4/13 – 5/15 ECS Policy Committee

9/05 – 5/15 ENGR:2730 Computers in Engineering Course Coordinator

2/12 – 2/14 Dean’s Advisory Promotion and Tenure Committee

9/09 – 5/12 College of Engineering Teaching Committee, Chairman last year

9/10 – 12/10 College of Engineering Grand Challenge Committee

3/08 – 5/10 Faculty/Staff Ad-hoc Workplace Environment Committee.

2/03 – 5/04 College Computer Services Committee, Chairman.

 4.3 University

10/04 – present Member of the Iowa Institute for Biomedical Imaging (IIBI)

3/04 – present Member of the Holden Comprehensive Cancer Center (HCCC)

3/04 – present Member of the Iowa Comprehensive Lung Imaging Center (I-CLIC)

1/16 – present Member of the University of Iowa Informatics Initiative (UI3)

8/19 – present Member of the Iowa Initiative for Artificial Intelligence (IIAI)

9/19 – 2/20 General Education CLAS Core Review Committee (CCRC)

4/14 – 5/19 Executive Committee Member, Aging Mind and Brain Initiative (AMBI)

8/14 – 5/15 Committee Member, ICON Steering Committee

9/13 – 5/15 Committee Member, University Ad Hoc Online Evaluation Committee

10/04 – 12/2011 Imaging Group Computer Infrastructure Director of the Iowa Institute for Biomedical Imaging (IIBI)

 4.4 Community, State, National and International

2003 – present **Board Member**, Information Processing in Medical Imaging (IPMI).

2021 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2021).

2021 **Reviewer**, Information Processing in Medical Imaging 2021, (IPMI 2021).

2021 **Reviewer**, IEEE International Symposium on Biomedical Imaging (ISBI) 2021.

2018 – 2020 **Local Organizing Co-chair**, IEEE International Symposium on Biomedical Imaging (ISBI) 2020.

2020 **Program Committee Member and Reviewer**, The 9th International Workshop on Biomedical Image Registration (WBIR 2020)

2019 **Scientific Review Committee Member**, Information Processing in Medical Imaging 2019, (IPMI 2019).

2017 – 2018 **Member of the Board of Associate Editors**, American Association of Physicists in Medicine (AAPM)

2018 **Program Committee Member and Reviewer**, The 8th International Workshop on Biomedical Image Registration (WBIR 2018)

2018 **Reviewer**, The Engineering in Medicine and Biology Conference. EMBC 2018.

2016 – 2017 **Associate Editor**, Medical Physics

2017 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2017).

2017 **Scientific Review Committee Member**, Information Processing in Medical Imaging 2017, (IPMI 2017).

2016 **Program Committee Member and Reviewer**, The 7th International Workshop on Biomedical Image Registration (WBIR 2016)

2016 **Special Session Chair**, IEEE International Symposium on Biomedical Imaging, (ISBI 2016), Special Session: Frontiers in Pulmonary Image Analysis.

2016 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2016).

2015 **Program Committee Member**, 1st International Workshop on DIFF-CV: Differential Geometry in Computer Vision for Analysis of Shapes, Images and Trajectories, to be held in conjunction with the 26th British Machine Vision Conference. 2015

2015 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2015).

2015 **Scientific Review Committee Member**, Information Processing in Medical Imaging 2015, (IPMI 2015).

2014 **Reviewer**, MICCAI 2014: Workshop on Spatiotemporal Image Analysis for Longitudinal and Time-Series Image Data.

2014 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2014).

2014 **Program Committee Member**, 2014 Computational Modeling of Objects Represented in Images: Fundamentals, Methods, and Applications, (CompIMAGE 2014)

2014 **Reviewer**, The Engineering in Medicine and Biology Conference. EMBC 2014.

2014 **Program Committee Member and Reviewer**, 2014 IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI)

2014 **Program Committee Member and Reviewer**, The 6th International Workshop on Biomedical Image Registration (WBIR 2014)

2013 **Program Committee Member and Reviewer**, MICCAI 2013 Workshop on Mesh Processing in Medical Image Analysis.

2013 **Program Committee Member and Reviewer**, MICCAI 2013 Workshop on Multimodal Brain Image Analysis.

2013 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2013).

2013 **Reviewer**, The Engineering in Medicine and Biology Conference. EMBC 2013.

2010-6/12 **Co-Chairman**, 5th International Workshop on Biomedical Image Registration, (WBIR 2012).

2012 **Program Committee Member**, MICCAI 2012 Workshop on Mesh Processing in Medical Image Analysis.

2012 **Reviewer**, The Engineering in Medicine and Biology Conference. EMBS 2012.

2012 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2012).

2012 **Reviewer**, IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI 2012)

2011 **Program Committee Member**, MMBIA 2012: IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis.

2011 **Scientific Review Committee Member**, Information Processing in Medical Imaging 2011, (IPMI 2011).

2011 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2011).

2011 **Program Committee Member**, MICCAI 2011 Workshop on Mesh Processing in Medical Image Analysis.

2011 **Program Committee Member**, MICCAI 2011 Workshop on Multimodal Brain Image Analysis.

2010 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2010).

2010 **Program Committee Member**, MMBIA 2010: IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis.

2010 **Technical Program Committee**, IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI 2010)

2010 **Reviewer**, 2010 IEEE International Symposium on Biomedical Imaging (ISBI'10), April 14-17, 2010 Rotterdam, Netherlands.

2010 **Scientific Review Committee Member**, 4th International Workshop on Biomedical Image Registration, (WBIR 2010).

2009 **Program Committee Member**, 2nd Workshop on 3D Physiological Human 2009, (3DPH 2009).

2009 **Scientific Review Committee Member**, Information Processing in Medical Imaging 2009, (IPMI 2009).

2009 **Program Committee Member**, MMBIA 2009: IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis.

2009 **Program Committee Member**, International Conference on Signal and Image Processing, (ICSIP 2009).

2009 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2009).

2008 **Reviewer**, Eleventh International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2008).

2008 **Technical Program Committee**, ninth IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA) in conjunction with CVPR'08.

2008 **Technical Program Committee**, 8th IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI 2008)

2008 **Reviewer**, 5th IEEE International Symposium on Biomedical Imaging (ISBI'08), May 14-17, 2008 in Paris, France.

2008 **Program Committee member**, Second International Conference on Cognition and Recognition during, Mysore, India, April 2008

2007 **Paper Reviewer**, Tenth International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2007).

2007 **Program Committee member**, IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA 2007) Rio de Janeiro, Brazil, 2007

2007 **Member** of the NIH Spatial-transformation Informatics Technology Initiative (SIfTI): a sub-committee of NIfTI to deal with the storage and interchange of non-linear spatial transformation information.

2007 **Scientific Review Committee member**, Tenth International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2007).

2005-07 **President** of Information Processing in Medical Imaging board (IPMI).

2004-10 **External Scientific Advisory Committee Member**, Virginia Commonwealth University (VCU) Radiation Oncology Program Project Grant

2006 **Technical Program Committee member**, Ninth International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2006).

2006 **Technical Program Committee member**, IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA 2006) New York City, NY

2006 **Technical Program Committee member**, Third International Workshop on Biomedical Image Registration (WBIR 2006), Utrecht, The Netherlands

2006 **Technical Program Committee member**, the seventh IEEE Southwest Symposium on Image Analysis and Interpretation 2006 (SSIAI’06).

2006 **Technical Program Committee member**, the 2nd International Workshop on Computer Vision Approaches to Medical Image Analysis (CVAMIA’06).

2006 **Paper Selection Committee member** and **Technical Program Committee member** for the 2006 IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI’06).

2006 **Technical Program Committee member**, IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2006), New York, NY

2005 **General Conference Chairman**, 19th International Conference on Information Processing in Medical Imaging, (IPMI 2005), Glenwood Springs, CO.

2005 **Reviewer**, Eighth International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2005).

3/7/05 **Study Section Member**, ZRG1 SBIB-Q 50R: PAR-03-106: Innovations in Biomedical Computational Science and Technology R21/R33.

2/3/05 **Study Section Member**, Special Emphasis Panel/Scientific Review Group 2005/05 NCI-E PCRB (Q3) meeting.

2004 **Reviewer**, Seventh International Conference on Medical Image Computing and Computer Assisted Intervention, MICCAI 2004.

2004 **Committee Member**, Computer Vision Approaches to Medical Image Analysis (CVAMIA) and Mathematical Methods in Biomedical Image Analysis (MMBIA) Workshop 2004.

2004 **Technical Conference Chairman**, 2nd IEEE International Symposium on Biomedical Imaging, ISBI 2004, Washington D.C.

2004 **Committee Member**, 17th International Conference on Pattern Recognition, ICPR 2004, Cambridge, United Kingdom.

2004 **Committee Member**, CARS 2004 Computer Assisted Radiology and Surgery, Chicago, IL.

2004 **Committee Member**, 2004 Southwest Symposium on Image Analysis and Interpretation, SSIAI 2004, Lake Tahoe, NV.

2003 **Committee Member**, 18th International Conference on Information Processing in Medical Imaging, IPMI 2003, Ambleside, England.

2003 **Committee Member**, The Second International Workshop on Biomedical Image Registration, WBIR 2003, Philadelphia, Pennsylvania.

2003 **Committee Member**, 17th International Congress and Exhibition Computer Assisted Radiology and Surgery CARS 2003, London, England.

2002 **Session Chair**, Fifth International Conference on Medical Image Computing and Computer Assisted Intervention MICCAI 2002, Tokyo, Japan.

2002 **Committee Member**, The Fifth Southwest Symposium on Image Analysis and Interpretation SSIAI 2002, Santa Fe, NM.

2002 **Committee Member**, International Symposium on Cardiovascular Imaging, Computer Assisted Radiology and Surgery, CARS 2002, Berlin, Germany.

2002 **Committee Member and Session Chair**, The First IEEE International Symposium on Biomedical Imaging, ISBI 2002, Washington DC.

2001 **Committee Member**, 17th International Conference on Information Processing in Medical Imaging, IPMI 2001, Davis, CA.

2001 **Committee Member**, Workshop on Mathematical Methods in Biomedical Image Analysis, MMBIA 2001, Kauai, HA.

2000 **Committee Member**, 3rd IEEE Workshop on Mathematical Methods in Biomedical Image Analysis, MMBIA 2000, Hilton Head Island, South Carolina.

2000 **Committee Member**, IEEE Southwest Symposium on Image Analysis and Interpretation, SSIAI 2000, Austin, Texas.

1999 **Committee Member**, International Workshop on Biomedical Image Registration, WBIR 1999, Ljubljana, Slovenia.

1998 **Committee Member**, Symposium on Cardiovascular Imaging, Iowa City, IA.

 4.5 Student Related

 4.5.1 Advisor to Student Groups

2006 - 2007 **Faculty Advisor** for the Team UI-ECE 2007 RoboCup virtual robots competition. Students: Zaid Towfic (ECE senior), James Harris (ECE grad student) Jeff McConnell (ECE sophomore), and Garrett Ejzak (ECE sophomore)

 4.5.2 Special Counseling Services

 None

 4.5.3 Other Student Services

 EIT review for circuits - 3/11/97

 4.6 Other

 None

5. Teaching Activities

 5.1 Courses Taught (exclude directed reading, individual investigations, thesis research)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Semester | CourseNumber | CourseTitle | Semester Hours | No. of Students | Remarks |
| S'97 | 57:008 | Electrical Circuits | 3 | 55 |  |
| F'97 | 55:146 | Digital Signal Processing | 3 | 15 |  |
| S'98 | 55:248 | Adv. Digital Image Proc. | 3 | 6 |  |
| S’98 | 55:074 | Independent Study (ADIP) | 3 | 1 |  |
| F’98 | 55:146 | Digital Signal Processing | 3 | 23+11 | video conf. |
| F’98 | 55:191 | ECE Graduate Seminar | 0 | 37 |  |
| S’99 | 55:042 | Signals and Systems | 3 | 15 |  |
| S’99 | 55:091 | ECE Professional Seminar | 0 | 27 |  |
| S’99 | 55:191 | ECE Graduate Seminar | 0 | 35 |  |
| F’99 | 55:042 | Signals and Systems | 3 | 43 |  |
| S’00 | 55:248 | Adv. Digital Image Proc. | 3 | 13 |  |
| S’00 | 55:090 | ECE Orientation Seminar | 0 | 3 |  |
| F’00 | 57:008 | Electrical Circuits | 3 | 117 |  |
| F’00 | 55:042 | Signals and Systems | 3 | 27 |  |
| S’01 | 55:042 | Signals and Systems | 3 | 17 |  |
| F’01 | 57:012 | Linear Systems | 3 | 41 |  |
| F’01 | 55:042 | Signals and Systems | 3 | 24 |  |
| S’02 | 55:248 | Adv. Digital Image Proc. | 3 | 14 |  |
| F’02 | 57:008 | Electrical Circuits | 3 | 125 |  |
| F’02 | 55:091 | ECE Professional Seminar | 0 | 29 |  |
| S’03 | 55:042 | Signals and Systems | 3 | 24 |  |
| S’03 | 57:008 | Electrical Circuits | 3 | 76 |  |
| F’03 | 55:148 | Digital Image Processing | 3 | 11 | Electronic classroom |
| F’03 | 55:191 | ECE Graduate Seminar | 0 | 38 |  |
| S’04 | 57:017 | Computers in Engineering | 3 | 63 |  |
| S’04 | 55:248 | Advanced Image Processing | 3 | 13 |  |
| Sum’04 | 57:017 | Computers in Engineering | 3 | 22 |  |
| F’04 | 57:017 | Computers in Engineering | 3 | 77 |  |
| F’04 | 55:040 | Linear Systems I | 3 | 17 |  |
| S’05 |  | Developmental Leave |  |  |  |
| F’05 | 57:017 | Computers in Engineering | 3 | 62 |  |
| F’05 | 55:148 | Digital Image Processing | 3 | 19 | Electronic classroom |
| F’05 | 55:090 | EE Orientation Seminar | 0 | 31 |  |
| S’06 | 57:017 | Computers in Engineering | 3 | 72 |  |
| F’06 | 57:017 | Computers in Engineering | 3 | 42 | Electronic classroom |
| F’06 | 55:148 | Digital Image Processing | 3 | 26 | Electronic classroom |
| S’07 | 57:017 | Computers in Engineering | 3 | 59 | Laptop classroom |
| F’07 | 57:017 | Computers in Engineering | 3 | 58 | Laptop classroom |
| S’08 | 57:017 | Computers in Engineering | 3 | 59 | Laptop classroom |
| F’08 | 57:017 | Computers in Engineering | 3 | 39 | Laptop classroom |
| S’09 | 57:017 | Computers in Engineering | 3 | 52 | Laptop classroom |
| F’09 | 57:017 | Computers in Engineering | 3 | 52 | Laptop classroom |
| S’10 | 59:006:003 | Engineering Problem Solving 2 | 3 | 70 | Laptop classroom |
| S’10 | 59:006:004 | Engineering Problem Solving 2 | 3 | 65 | Laptop classroom |
| F’10 | 57:017 | Computers in Engineering | 3 | 42 | Laptop classroom |
| F’10 | 055:292 | Sem Img Proc, Comp Vision & Med Imaging (IIBI Seminar) | 0 | 23 (40+ attending) |  |
| S’11 | 59:006:003 | Engineering Problem Solving 2 | 3 | 71 | Laptop classroom |
| S’11 | 59:006:004 | Engineering Problem Solving 2 | 3 | 69 | Laptop classroom |
| F’11 |  | Developmental Leave |  |  |  |
| S’12 | 59:006:003 | Engineering Problem Solving 2 | 3 | 61 | Laptop classroom |
| S’12 | 59:006:004 | Engineering Problem Solving 2 | 3 | 61 | Laptop classroom |
| F’12 | 55:148 | Digital Image Processing | 3 | 36 | Computer classroom |
| F’12 | 55:091 | ECE Professional Seminar | 1 | 86 |  |
| S’13 | 59:006:003 | Engineering Problem Solving 2 | 3 | 66 | Laptop classroom |
| S’13 | 59:006:004 | Engineering Problem Solving 2 | 3 | 69 | Laptop classroom |
| F’13 | 55:148 | Digital Image Processing | 3 | 40 | Computer classroom |
| F’13 | 55:091 | ECE Professional Seminar | 1 | 89 |  |
| S’14 | 59:006:003 | Engineering Problem Solving 2 | 3 | 70 | Laptop classroom |
| S’14 | 59:006:004 | Engineering Problem Solving 2 | 3 | 66 | Laptop classroom |
| F’14 | ECE:5480 | Digital Image Processing | 3 | 45 | Computer classroom |
| F’14 | ECE:3000 | ECE Professional Seminar | 1 | 87 |  |
| S’15 | ENGR:1300:003 | Engineering Problem Solving 2 | 3 | 72 | Laptop classroom |
| S’15 | ENGR:1300:004 | Engineering Problem Solving 2 | 3 | 71 | Laptop classroom |
| F’15 | ENGR:1300:004 | Engineering Problem Solving 2 (honors section) | 3 | 45 | Laptop classroom |
| F’15 | ECE:3000 | ECE Professional Seminar | 1 | 85 |  |
| S’16 | ENGR:1300:003 | Engineering Problem Solving 2 | 3 | 72 | Laptop classroom |
| S’16 | ENGR:1300:004 | Engineering Problem Solving 2 | 3 | 72 | Laptop classroom |
| F’16 | ENGR:1300:004 | Engineering Problem Solving 2 | 3 | 31 | Laptop classroom |
| S’17 | ENGR:1300:003 | Engineering Problem Solving 2 | 3 | 68 | Laptop classroom |
| S’17 | ENGR:1300:004 | Engineering Problem Solving 2 | 3 | 68 | Laptop classroom |
| S’17 | ECE:3998 | Independent Study: Computer Science Video Game Design | 3 | 1 |  |
| F’17 |  | Developmental Leave |  |  |  |
| S’18 | ENGR:1300:003 | Introduction to Engineering Computing | 3 | 70 | Laptop classroom |
| S’18 | ENGR:1300:004 | Introduction to Engineering Computing | 3 | 64 | Laptop classroom |
| Sum’18 | ENGR:2730 | Computers in Engineering | 3/2 | 27 (3sh) + 9 (2sh) | Laptop classroom |
| F’18 | ECE:3000 | ECE Prof Seminar | 1 | 113 |  |
| S’19 | ENGR:2730:AAA | Computers in Engineering | 3/2 | 47 (3sh) + 18 (2sh) | Laptop classroom |
| S’19 | ENGR:2730:BBB | Computers in Engineering | 3/2 | 44 (3sh) + 21 (2sh) | Laptop classroom |
| F’19 | ENGR:2730:002 | Computers in Engineering | 3 | 39 | Laptop classroom |
| S’20 | ENGR:2730 | Computers in Engineering | 3 | 96 | Laptop classroom and online |
| F’20 | ENGR:2730 | Computers in Engineering | 3 | 87 | Online |
| S’21 | ENGR:2730 | Computers in Engineering | 3 | 54 | Online |
| F’21 | ENGR:2730 | Computers in Engineering | 3 | 80 | Laptop classroom |

 5.2 Graduate Student Advising and Committees

 Notes:

 1. Date of completion of degree, or expected date.

 2. Topic or title of thesis.

 3. Award nominations or awards earned by dissertation.

 4. Student's first permanent position after graduation, if known.

 5.2.a Ph.D. Dissertation Supervision

1. Hans Johnson, 6/97 – 5/02, Image Registration Methods for the Synthesis and Evaluation of Anatomical Population Summaries, **Ph.D. May 2002**. Associate Professor in Electrical and Computer Engineering, The University of Iowa.
2. Jianchun He, 6/99 – 8/03, Large Deformation Elastic Image Registration, **Ph.D. Aug 2003**.
3. Xiujuan Geng, 6/02 – 9/07, Transitive Inverse-Consistent Image Registration and Evaluation, **Ph.D. Dec 2007**.
4. Dinesh Kumar, 8/03 – 5/11, Image Registration Methods for Constructing Probabilistic Lung Atlases, **Ph.D. May 2011.**
5. Xuguang Jiang, 1/11 – 5/11, Iterative Reconstruction Method for Three-Dimensional Non-Cartesian Parallel MRI, **Ph.D. May 2011.**
6. Kunlin Cao, 9/06 – 5/12, Mechanical Analysis of Lung CT Images Using Nonrigid Registration. **Ph.D. May 2012.**
7. Cheng Zhang, 9/07 – 12/13, Nonrigid Image Registration Using Uncertain Surface Constraints with Application to Radiation Therapy. **Ph.D. Dec 2013.**
8. Joo Hyun Song, 1/06 – 5/17, Methods for Evaluating Image Registration. **Ph.D. May 2017.**
9. Wei Shao, 9/13 – 6/2019, Improving Functional Avoidance Radiation Therapy by Image Registration. **Ph.D. Aug 2019.**
10. Melanie King, 9/16 – 7/20, Length Space Skeletonization. (Co-advised with Oguz Durumeric). **Ph.D. Aug 2020.**
11. Yue (Amanda) Pan, 9/13 – 9/20, Characterization and Biomechanical Analysis of Pulmonary Disease Using Varifold-based CT Image Registration, **Ph.D. Dec 2020**.
12. Di Wang, 9/19 – present, Image Registration for SPIROMICS

 5.2b MS Thesis Supervision

1. Ayananshu Banerjee, 1/95 - 6/96, High-Dimensional Anatomical Maps and their Applications in Empirical Estimation Functional Imaging and Neuromorphometry, **M.S. May 1996**, Co-supervised with M.I. Miller at Washington University, St. Louis.
2. Peng Yin, 1/98 -12/99, Image Registration for Brachytherapy Treatment Planning in Radiotherapy of Cervical Cancer, **M.S. Dec 1999**, Design engineer, EMC Corp, Hopkinton, MA.
3. Francie McKee, 1/99 – 5/00, Measurement of Dysmorphic Infant Skull Shape Change due to Surgery and Growth Using Consistent Linear-Elastic Image Registration, **M.S. May 2000**.
4. Hans Johnson, 6/97-5/00, Method for Consistent Linear-Elastic Medical Image Registration, **M.S. May 2000**.
5. Blake Carlson, 6/99 – 5/01, Image Registration for Brachytherapy Treatment Planning in Radiotherapy of Cervical Cancer, **M.S. May 2001.** Software engineer, Etnus, Natick, MA.
6. John Dill, 6/00 – 5/02, Toolbox for Registration and Analysis, **M.S. May 2002.** Research Assistant, Dept of Psychiatry, The University of Iowa.
7. Dinesh Kumar, 8/01 – 8/03, Detection of Population Shape Differences Using Image Registration, **M.S. Aug. 2003.** Studying for PhD.
8. Rajesh Gangabathina, 7/02 – 12/03, Web-based Remote Processing System for Image Registration, **M.S. Dec 2003.** Software engineer. A2Z Inc, (http://a2zshow.com)
9. Joo Hyun Song, 6/03 – 12/05, 4D Tracking Lung Tissue in Limited View Multislice CT with Inverse Consistent Image Registration, **M.S. Dec 2005.** Studying for PhD.
10. Tom Idstein, 8/04 – 7/06, Building a low-cost, moderate resolution device to measure the uptake and distribution in time and space of P.E.T. radio-pharmaceuticals. Co-advising with Richard Hichwa. **M.S. Aug. 2006.**
11. Jake Nickel, 1/07 – 5/08, Development of an Electronic Lung Airway Atlas. **M.S. May 2008.** Working at Rockwell-Collins.
12. Kunlin Cao, 9/06 – 5/08, Local Lung Tissue Expansion Analysis based on Inverse Consistent Image Registration. **M.S. May 2008.**
13. James Harris, 5/07 – 8/08, Nonrigid Image Registration Evaluation Project Software Design. **M.S. Aug. 2008.**
14. Ying Wei, 9/07 – 12/09, Non-rigid Image Registration Evaluation using Common Evaluation Database. **M.S. Dec. 2009.**
15. Weichen Gao, 9/08 – 12/10, Development of a Human Lung Query Atlas, **M.S. Dec 2010.**
16. Jeffrey Hawley, 6/09 – 7/11, Software Architecture of the Non-rigid Image Registration Evaluation Project. **M.S. July 2011.**
17. Halim Choi, 1/10 – 7/11, Framework for Reporting Non-rigid Image Registration Performance. **M.S. July 2011.**
18. Bowen Zhao, 9/13 – 7/16, Tissue Preservation Deformable Image Registration for 4DCT Pulmonary Images. **M.S. July 2016.**
19. Yue (Amanda) Pan, 9/13 – 12/16, Current- And Varifold-Based Registration of Lung Vessels and Lung Surfaces. **M.S. Dec 2016.**
20. Wei Shao, 9/13 – 12/16, Identifying the Shape Collapse Problem in Large Deformation Image Registration. **M.S. Dec 2016.**

 5.2c Ph.D. Committee Membership

1. Renuka Uppaluri, Automated Analysis of Pulmonary Parenchyma From CT Images, **Ph.D. S'97**, Thesis supervisor: Milan Sonka.
2. Weidong Liang, Automated Vessel Segmentation and Vessel Diameter Measurement in Brachial Ultrasound Time Series, **Ph.D. S'98**, Thesis supervisor: Milan Sonka.
3. Marek Brejl, Automated Initialization and Automated Design of Border Detection Criteria in Edge-based Image Segmentation, **Ph.D. F’99**, Thesis supervisor: Milan Sonka.
4. Roberto Lopez-Valcarce, Blind Equalization of Linear and Nonlinear Digital Communication Channels from Second Order Statistics, **Ph.D. F’00**, Thesis supervisor: Soura Dasgupta.
5. Jan Kybic, Elastic Image Registration Using Parametric Deformation Models, **Ph.D. Sum’01**, Swiss Federal Institute of Technology, Lausanne, Switzerland. Served as Expert on Thesis committee. Thesis supervisor: Michael Unser.
6. Qingyu Li, Blind Source and Channel Equalization, **Ph.D. Sum’03**, Thesis supervisor: Er-Wei Bai.
7. Juerg Tschirren, Segmentation, Anatomical Labeling, Branchpoint Matching, and Quantitative Analysis of Human Airway Trees in Volumetric CT Images, **Ph.D. F’03**, Thesis supervisor: Milan Sonka.
8. Steve Mitchell, Active Appearance Model Segmentation in Medical Image Analysis, **Ph.D. Sum’04**, Thesis supervisor: Milan Sonka.
9. Ben Baojun Li, Inter-Subject Registration and Warping of CT Images to Establish a Normative Human Lung Atlas, **Ph.D. F’04**, Thesis supervisor: Joe Reinhardt.
10. Mark Olszewski, Assessment of Coronary Artherosclerosis Using Intravascular Ultrasound and Multidetector Computed Tomography, **Ph.D. F’05**, Thesis supervisor: Milan Sonka.
11. Fuxing Yang, Quantitative Analysis of Living Tumor Cells Using Large Scale Digital Cell Analysis System, **Ph.D. S’05**, Thesis supervisor: Milan Sonka.
12. Xiangwei Zhang, Computer Aided Detection of Pulmonary Nodule in Helical CT Images, **Ph.D. F’05**, Thesis supervisor: Milan Sonka.
13. Honghai Zhang, Segmentation and Computer-Aided Diagnosis of Cardiac MR Images Using 4-D Active Appearance Models, **Ph.D. Sum’07**, Thesis supervisor: Milan Sonka.
14. Fei Zhao, Congenital Aortic Disease: 4D Magnetic Resonance Segmentation and Quantitative Analysis, **Ph.D. F’07**, Thesis supervisor: Milan Sonka.
15. Yuansheng Sun, **Ph.D. F’07**, Thesis supervisor: Michael A. Macky
16. Yin Yin, Multi-Surface Multi-Object Optimal Image Segmentation: Application in 3D Knee Joint Imaged by MRI **Ph.D. Sum’10**, Thesis supervisor: Milan Sonka.
17. Nathan Cahill, **Ph.D. S’10**, Constructing and Solving Variational Image Registration Problems, University of Oxford. Thesis supervisor: Alison Noble.
18. Kia Ding, **Ph.D. Sum’10**, Regional Lung Function and Mechanics Using Image Registration, Thesis supervisor: Joe Reinhardt.
19. Joseph M. Howard, On Low Power and Circuit Parameter Independent Tests, and a New Method of Test Response Compaction, **Ph.D., F’10**, Thesis supervisor: Sudhakar Ready
20. Vladlena Gorbunova, **PhD, F’10**, Image Registration of Lung CT Scans for Monitoring Disease Progression, University of Copenhagen. Thesis supervisor: Marleen de Bruijne
21. Wen Li, **Ph.D. S’12**, Automated parcellation on the surface of human cerebral cortex generated from MR imagesThesis supervisor: Vince Magnotta.
22. Ryan E. Amelon, **Ph.D. S’12**, Development and characterization of a finite element model of lung motion. Thesis supervisor: ML Raghavan.
23. Scott Robertson, **Ph.D. S’13**, Improving Lung Tumor Localization during Image-Guided Radiotherapy using a Block-Matching Registration Algorithm, VCU, Thesis supervisor: Geoffrey D Hugo.
24. Kaifang Du, **Ph.D. S’13**, Regional Pulmonary Function Analysis Using Image Registration and 4DCT, Thesis supervisor: Joseph M. Reinhardt and John Bayouth.
25. Joy Matsui, **Ph.D. S’14,** Development of Image Processing Tools and Procedures for Analyzing Multi-site Longitudinal Diffusion-weighted Imaging Studies, Thesis supervisor: Hans Johnson.
26. Douglas J. Vile, **Ph.D. F’14,** Statistical modeling of interfractional tissue deformation and its application in radiation therapy planning. Thesis supervisor: Jeffrey F Williamson.
27. Ali Ghayoor, **Ph.D. S’17**, Improved interpretation of brain anatomical structures in magnetic resonance imaging using information from multiple image modalities, Thesis supervisor: Hans Johnson
28. Christopher L Guy, **PhD. Sum'17**, An Algorithm to Improve Deformable Image Registration Accuracy in Challenging Cases of Locally-Advanced Non-Small Cell Lung Cancer, Thesis supervisor: Geoffrey D Hugo.
29. Matthew J. Riblett, **PhD. Sum'18**, Thesis supervisor: Geoffrey D Hugo.
30. Sarah Gerard, **PhD. Fall'18**, Thesis supervisor: Joseph M. Reinhardt.

 5.3 Undergraduate Student Advising and Mentoring

1. Freddy B. So, 7/95 – 6/96, craniofacial archive recovery, Washington University.
2. Blake Carlson, 6/98 – 5/99, ATM high speed networking.
3. Husam Abu-Zaydeh, 6/99 – 12/99, developed a user interface for deformable image software.
4. Luke Hirschy, 6/00 – 8/00, registered data sets for a collaborative project with Christian Barillot.
5. Joel Martin, 6/01 – 8/01, created and validated average brain data sets.
6. Nichole Taylor, 6/06 – 7/06, AGEP summer student from Iowa State University, Developed a Web site for the Nonrigid Image Registration Evaluation Project
7. Jake Nickel, 1/06 – 12/07, Developing computer atlas of human and rat lung.
8. Deffo (Michael) Tamboue, 6/07-7/07, AGEP summer student from Jackson State University, Helped implement an XML parser for the Nonrigid Image Registration Evaluation Project
9. Hayley Abbas, 5/07 – 12/07, Created Medical Image Artwork.
10. Jeffrey Hawley, 5/07 – 5/09, Visualization for Nonrigid Image Registration Evaluation Project
11. Kate Rasing, 1/08 – 5/10, Web site design for Nonrigid Image Registration Evaluation Project
12. James M. Howard, 6/08 – 7/08, AGEP summer student from Mississippi Valley State University, Building software tools for the Nonrigid Image Registration Evaluation Project
13. Zafar Khan, 6/20 – present, Deep Learning for Image Registration.

 5.3a Undergraduate Student Project Supervision

 Notes:

 1. Honor projects, undergraduate and graduate directed study, non-thesis special

 investigations, etc.

 2. Student awards arising from this work. If any

1. Blake Carlson, High Performance ATM Networking and The Washington University Gigabit Switch, honors project, S’99.
2. Fred Collison, 8/01 – 5/02, Biomedical Engineering Senior Design project.
3. John Gourley, 8/01 – 5/02, Biomedical Engineering Senior Design project.
4. Michal Rysz, 1/02 – 5/02, Biomedical Engineering Senior Design project.
5. Brent Owen, 10/03- 5/04, Biomedical Engineering Senior Design project
6. Sara Juvenal, 10/03- 5/04, Biomedical Engineering Senior Design project.
7. Peiman Mohammadi,10/03- 5/04, Biomedical Engineering Senior Design project
8. David Simon, 1/06 – 5/06, RoboCup 2006, Honors project
9. Nick Kiguta, 1/07 – 5/07, Honors project & Developing computer atlas of human.
10. Ben Mossman, 9/08 – 5/09, EE Senior Design project customer
11. Daniel Lee, 9/08 – 5/09, EE Senior Design project customer
12. Dmitry Kallestinov, 9/08 – 5/09, EE Senior Design project customer
13. Daniel Juel, 9/08 – 5/09, EE Senior Design project customer
14. Ezekiel Gunnink, 1/15 – 5/15, 55:182 Software Engineering Languages and Tools.
15. Brandon Laidig, 1/15 – 5/15, 55:182 Software Engineering Languages and Tools.
16. Mario Zucco, 1/15 – 5/15, 55:182 Software Engineering Languages and Tools.
17. Dominic Zucco, 1/15 – 5/15, 55:182 Software Engineering Languages and Tools.
18. Victoria Utter, 2/16 – 5/16, ECE:5830 Software Engineering Project
19. Austin Belk, 2/16 – 5/16, ECE:5830 Software Engineering Project
20. Laura Shepherd, 2/16 – 5/16, ECE:5830 Software Engineering Project
21. Madeline Gilbert, 2/16 – 5/16, ECE:5830 Software Engineering Project
22. Faculty Advisor for Kick-Start Funding for Prairie Hawk by **Sy Butler, Daniel Kelly and Liam Hagan**, 9/16 – 5/17.
23. Faculty Advisor for Kick-Start Funding for the Smart Mirror by **Liam Hagan, Sy Butler, Daniel Kelly, and Zane Johnson**, 9/16 – 5/17.
24. Faculty Advisor for Kick-Start Funding for the Smart Snow Globe by **Stephanie Krogh, Sawyer Goetz, and Jacob Thompson**, 9/17 – 5/18.
25. Faculty Advisor for Kick-Start Funding for Kineta (Self-defense device that shocks attackers when they come in contact with you.) by **Ashley P Mathews**, 9/18 – 5/19, Creative Kickstart,

 5.3b Other Student Mentoring and Special Advising

 Notes:

 1. Name of program, nature of activities; includes interdepartmental advising.

 Sem Student Description1

 None

 5.3c Undergraduate Student Advising

|  |  |
| --- | --- |
| Semester | Number of Advisees |
| S'97 | 27 |
| F'97 | 14 |
| S’98 | 12 |
| F’98 | 16 |
| S’99 | 15 |
| F’99 | 19 |
| S’00 | 19 |
| F’00 | 10 |
| S’01 | 15 |
| F’01 | 12 |
| S’02 | 14 |
| F’02 | 21 |
| S’03 | 24 |
| F’03 | 23 |
| S’04 | Forgot to record |
| F’04 | Forgot to record |
| S’05 | Developmental Leave |
| F’05 | 18 |
| S’06 | 20 |
| F’06 | 18 |
| S’07 | 21 |
| F’07 | 20 |
| S’08 | 19 |
| F’08 | Forgot to record |
| S’09 | 16 |
| F’09 | 12 |
| S’10 | 11 |
| F’10 | 15 |
| S’11 | 21 |
| F’11 | Developmental Leave |
| F’12 | 17 |
| S’13 | 19 |
| F’13 | 19 |
| S’14 | 19 |
| F’14 | 20 |
| S’15 | 20 |
| F’15 | 18 |
| S’16 | 18 |
| F'16 | 16 |
| S'17 | 19 |
| F'17 | Developmental Leave |
| S’18 | 21+ all special cases in Department |
| F’18 | ~30 + all special cases in Department |
| S’19 | 30 + all special cases in Department |
| F’19 | 20 + all special cases in Department |
| S’20 | 20 + all special cases in Department |
| F’20 | 21 + all special cases in Department |
| S’21 | 23 + all special cases in Department |
| F’21 | 23 + all special cases in Department |

 5.4 Supervision of Postdoctoral Associates

 Note:

 1. Associate's present position, if known.

 Present

 Sem Name Project Description Position 1

1. 12/12 – 7/13 Ipek Oguz An Engineering Approach to Bipolar Disorder
2. 3/14 – 6/14 Cheng Zhang Consistent Anatomy Registration for Lung Cancer Adaptive Radiation Therapy

 5.5 Seminars and Short Courses

7/97, Milwaukee, WI, American Association of Physicists in Medicine (AAPM), “Electronic Anatomic Atlases for Medical Imaging,” conference tutorial, presented with Michael W. Vannier.

7/99, Nashville, TN, American Association of Physicists in Medicine (AAPM), “Advancements in Visualization,” conference symposium, one of four invited speakers.

 5.6 Advisor to Student Groups

 Note:

 1. Name of program, nature of activities.

 Sem Group Description1

 None

 5.7 Teaching Awards and Nominations

 Note:

 1. Indicate if nominated but not awarded.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Title | Grantor | Selection Process | Nominee1 |
| 2007 | President's Instructional Technology Innovation Award | University of Iowa President | Dept & College Recommendations | Nominated but did not win |
| 5/2008 | Outstanding Mentor Award 2008 | University of Iowa Graduate College | Student & Dept Recommendations | Nominated but did not win |
| 2008 | 2008 Award for Outstanding Achievement in Teaching | University of Iowa College of Engineering | Dept Recommendations | Won |
| 2012 | 2012 Spring semester award for the most helpful professor in the college of engineering | Chi Omega Sorority | unknown | Won |
| 2013 | Recognized by the Graduating Class of 2013 for making a positive impression in their lives. | Graduating Class of 2013 | unknown | Won |
| 2019 | Graduate College Outstanding Faculty Mentor Award | University of Iowa Graduate College | University graduate college selection committee | Honorable Mention |

 5.8 Formative Evaluations

 (listing of efforts undertaken to improve personal teaching effectiveness, including peer observation, etc.)

8/29/97 Attended a 2-hour class entitled "How to give a Lecture" sponsored by the Center for Teaching, The University of Iowa.

10/11/97 Attended Outcomes Assessment in Engineering, 59th Annual ASEE North Midwest Section Meeting, The University of Iowa.

 5.9 Textbooks and Educational Publications

 None

 5.10 Funded and Unfunded Course, Curriculum, Software, and Laboratory Development

 (listing of developmental efforts and innovations focused on improvement of instruction, including efforts to obtain external funding for laboratory and curricular development)

1. P.I. on grant entitled "ATM Distributed Medical Imaging." The goal of this grant is to connect the Medical School and College of Engineering together via high-speed ATM network for research purposes and to provide access to ATM technology for classroom instruction.
2. 12/06-1/07 Helped design and implement the 72 seat laptop classroom in 2229 SC. This classroom increased the number of student accessible computers in the College of Engineering by more than 50% (from 140 to 220). It provided a second electronic classroom in the college and made it possible to teach interactive lectures for courses with large class size.
3. 1/07-5/07 Taught the first course in the laptop classroom and developed interactive lectures for the course 57:017 Computers in Engineering.

 5.11 Other

 (Attendance at teaching workshops; student comments of particular interest; etc.)

10/2/98 Together with Milan Sonka, organized a trip to the Mayo Clinic, Rochester, MN for 10 graduate students to give short presentations.

11/20/98 Together with Milan Sonka, organized a trip for 10 graduate students from the Mayo Clinic to give short presentations to the CEIG at the University of Iowa.

10/6/00 Together with Milan Sonka, organized a trip to the Mayo Clinic, Rochester, MN for 16 graduate students to give short presentations.

7/11 – 7/15/05 Together with Milan Sonka, organized the 19th International Conference on Information Processing in Medical Imaging 2005 Colorado Mountain College, Glenwood Springs, Colorado, USA. As part of this conference we brought 9 of our graduate students to work as staff members and attend the conference.

6/15/07 Organized a trip to the Mayo Clinic in Rochester MN for 18 graduate students to attend the Mayo Clinic Symposium on “Medical Image Computing and Image Guided Intervention”

6/24 – 6/29/07 Organized and funded a trip to the Massachusetts Institute of Technology for 8 of my graduate students and one of Joe Reinhardt’s students to participate in the fifth National Alliance for Medical Image Computing (NA-MIC) Programming Project week event.

8/21/07 Helped organize and run the first annual Introduction to Iowa Institute of Biomedical Imaging (IIBI) Boot Camp. Attendees include 8 medical imaging professors, 4 staff, 27 students, and 3 postdocs.

6/23 – 6/27/08 Organizing and funded a trip to the Massachusetts Institute of Technology for 6 of my graduate students to participate in the sixth National Alliance for Medical Image Computing (NA-MIC) Programming Project week event.

7/14 – 7/18/08 Organizing and funded a trip for three of graduate students to the Summer School on "Mathematics in Brain Imaging" at UCLA's Institute for Pure and Applied Mathematics (IPAM).

8/19/08 Helped organize and run IIBI Boot Camp 2008.

5/19 – 12/20 Redesigned and simplified ENGR:2730 Computers in Engineering to use the Simple Fast Multimedia Library (SFML) rather than use the 3pi robots. Students prefer the new version of the course much more than the old version.

3/20 – 5/21 Converted ENGR:2730 to a fully online course due to COVID-19.

8/20 – 12/20 Mentored Yu-Jung Chu in her first semester teaching at Iowa during online teaching due to COVID-19.

8/20 – 2/21 Helped with ABET accreditation of EE and CSE programs.

1/19 – 4/21 Major contribution to getting CSE articulation agreement with Kirkwood Community College designed and approved.

6. Research Activities

 6.1 Active research fields at present (major fields only)

 Image Registration, Computational Anatomy, Medical Imaging, Signal and Image Processing, Pattern Recognition

 6.2 Principal Investigator on contracts and/or grants (last five years)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Contract or Grant Title | Sponsor | Start and End Date | Budget(yearly) | Acct. No. | PercentCredit |
| Consistent Anatomy Registration for Lung Cancer Adaptive Radiation Therapy (Hugo, Virginia Commonwealth University PI, Christensen, subcontract PI) | NIH/NCI | 2/13 to 1/18 | $90,638  | R01CA166119 | 100 |
| Correlation of Bipolar Disorder and pH changes in the Brain Using T1rho MR Imaging | College of Engineering private donor | 1/11 – 12/18 | $1,000,000 | N/A | 25% |
| Image Registration for Image-Guided Adaptive Radiation Therapy (Williamson, Virginia Commonwealth University PI, Christensen, subcontract PI), | NIH/NCI | 4/07-3/12 | $61,281 | P01 CA116602 | 100% |
| NIREP: Non-rigid Image Registration Evaluation Project | NIH/NIBIB | 6/06 – 5/10 | $212,500 | R33 EB004126 | 100% |
| NIREP: Non-rigid Image Registration Evaluation Project | NIH/NIBIB | 6/05 – 5/06 | $100,000 | R21 EB004126 | 100% |
| Career Development Award | Obermann Center | 1/05-5/05 | $500 | N/A | 100% |
| Information Processing in Medical Imaging 2005 Conference grant | Obermann Center | 3/05 | $750 | N/A | 100% |
| Information Processing in Medical Imaging 2005 Conference grant | NIH | 3/05 to 2/06 | $10,000 | R13EB005133 1R13EB005133 | 100% |
| Information Processing in Medical Imaging 2005 Conference grant | The Whitaker Foundation | 1/05 to 7/05 | $5,000 | N/A | 100% |
| Lung Trajectory Mapping for IMRT (Low, Washington University, Christensen Subcontract PI) | NIH | 4/03 to 3/07 | $47,082 | R01 CA096679 | 100% |
| Quantitative Characterization of Congenital Skull Shape Deformity | The Whitaker Foundation | 4/00 to 6/01 | $80,000 | N/A | 100% |
| Modeling Cranial Dysmorphology and Its Correction Using Pattern Theory | The Whitaker Foundation | 8/97 to 1/00 | $125,893 | N/A | 100% |
| ATM Distributed Medical Imaging | Washington University / NSF | 11/98 to 11/01 | $80,000 equipment | N/A | 100% |
| A High-Speed Network for Distributed Medical Imaging: Phase 1 | The University of Iowa (Old Gold) | 7/98 | $6000 | N/A | 100% |
| Image-Based Dose Planning in Intracavitary Brachytherapy (Williamson, Washington University, PI, Christensen Image Registration Project Leader) | NIH | 07/98 to 02/2002 | $165,423 | R01 CA75371 | 100% |

\*Responsibility as a percentage of the grant budget

 6.3 Participation (5 hours/week or more) in research contracts and/or grant

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Contract or Grant Title | Sponsor | Start and End Date | Budget | Acct. No. | PercentCredit |
| Lung Biomechanics and Disease Progression in SPIROMICS (Reinhardt PI) | NIH | 08/18 to 5/22 | $670,794 | HL142625 | 15% |
| Cerebellar Metabolism, Neural Circuits, and Symptoms in Bipolar Disorder (Magnotta PI) | NIH | 9/17 to 6/22 | $590,632 | MH111578 | 10% |
| Roy J. Carver Charitable Trust: Bipolar Disorder Research Program of Excellence | Roy J. Carver Charitable Trust | 4/17 to 3/22 | $450,000 | N/A | 5% |
| Predicting PulmonaryFunction Change to Improve Radiation Planning and Outcome (Bayouth PI, Rienhardt Subcontract PI) | NIH/NCI | 4/13 to 3/18 | $221,212 | CA166703 | 50% |
| Precise Correspondence of 3D Pathology With Radiological Features in Lung Nodules (McLennan) | NIH/NCI | 9/08 to 7/10 | $386,354 | CA129022 | 5% |
| Large-Scale Computing and Visualization for Cardiopulmonary Imaging (Lin), Instrumentation grant | NIH/NCRR | 2/08 | $473,636 | 1S10RR22421-01A2 | 10% |
| Regional Lung Mechanics by 3D Image Registration (Reinhardt, PI) | NIH/NHLBI | 7/06 to 6/011 | $326,783 | R01 HL079406 | 10% |
| Quantitative CT-Based Lung Atlas of the Mouse (Hoffman) | NIH/NHLBI | 7/06 to 6/10 | $456,804 | R01 HL080285 | 10% |
| Image and Model Based Analysis of Lung Disease (Hoffman, PI) | NIH | 12/99 to 6/10 | $1,993,762 | R01 HL64368 | 5% |
| 3D Imaging & Computer Model of the Respiratory Tract (Corley, PI, Hoffman, Subcontract PI) | NIH/NHLBI | 9/04 to 8/09 | $32,035 | R01HL073598 | 50% |
| Spiral CT for Cochlear Implantation Research Plan (Wang, G., PI) | NIH | 4/99 to 3/2004 | $685,480 | R01 DC03590 | 8% |
| Normal MR Neuromorphometry by Global Pattern Matching (Vannier PI) | NIH/NIDS | 4/96 to 3/2001 | $1,510,332 | R01 NS35368 | 15% |
| A Collaborative Educational Environment for Functional Cardiovascular Image Analysis (Chandran, PI) | The Whitaker Foundation | 1/97 to 11/98 | $308,517 | N/A | 4% |

 Pending contracts and/or grants

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Contract or Grant Title | Sponsor | Start and End Date | Budget | Acct. No. | PercentCredit |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Invited Presentations:**

1. **Christensen, G.E.**, Rabbit, R.D., Miller, M.I. A deformable neuroanatomy textbook based on viscous fluid mechanics. 1993 Conference on Information Sciences and Systems, Johns Hopkins University, March, 1993. Invited by Clem Karl.
2. **Christensen, G.E.**, Miller, M.I. Deformations of Anatomical Shape. 1994 SIAM Annual Meeting, San Diego, California, July, 1994. Invited by Yali Amit.
3. **Christensen, G.E.**, Miller, M.I. Theory Institute on Large-Scale Medical Imaging, Argonne National Laboratories, August, 1995. Invited by Man Kam Kwong.
4. **Christensen, G.E.**, Image Registration via Global Shape Models. Approaches to Symbolic Representations of Brain Structures, Workshop at the Max-Planck Institute of Cognitive Neuroscience, Leipzig, Germany, December, 1997. Invited by Frithjof Kruggel.
5. **Christensen, G.E.**, Synthesizing Average Brain Shape and Validation, Institute for Pure and Applied Mathematics Workshop on Mathematics and Modeling in Brain Mapping, UCLA, May, 2001. Invited by Paul Thompson and Arthur Toga.
6. **Christensen, G.E.**, Consistent Landmark and Intensity Based Image Registration, Swiss Federal Institute of Technology, Lansanne, Switzerland, June, 2001. Invited by Michael Unser.
7. **Christensen, G.E.**, Minimizing Sources of Errors in Medical Image Registration, First IEEE International Symposium on Biomedical Imaging. Washington DC. July, 2002, Invited by Christos Davatzikos.
8. **Christensen, G.E.**, Medical Image Registration, Fifth International Conference on Medical Image Computing and Computer Assisted Intervention. Tokyo, Japan. September, 2002, Invited by Paul Thompson.
9. **Christensen, G.E.**, Virginia Common Wealth University, Richmond Virginia, November, 2002. Invited by Jeff Williamson.
10. **Christensen, G.E.**, MIT Martinos talk. Martinos Center for Biomedical Imaging, MGH-NMR and MIT, Boston, May, 2003. Invited by Bruce Fischl.
11. **Christensen, G.E.**, 2004 IEEE International Symposium on Biomedical Imaging From Nano to Macro, Arlington, Virginia, April, 2004. Invited by Paul Thompson.
12. **Christensen, G.E.**, Computer Vision Approaches to Medical Image Analysis (CVAMIA) and Mathematical Methods in Biomedical Image Analysis (MMBIA) Workshop, Prague, Czech Republic, May, 2004. Invited by Milan Sonka.
13. **Christensen, G.E.**, Building an anatomical atlas. Pacific Northwest National Laboratories BRP meeting 6/1/05. Invited by Richard Corley.
14. **Christensen, G.E.**, Transitive and Inverse-Consistent Image Registration at AAPM regional meeting held at The University of Iowa, 11/2/05. Invited by John Bayouth.
15. **Christensen, G.E.**, Craniofacial Image Analysis for Biology, Clinical Genetics, Diagnostics and Treatment, October 6, 2006 in Copenhagen, Denmark. Invited by Tron Darvann.
16. **Christensen, G.E.**, Introduction to the Non-Rigid Image Registration Evaluation Project (NIREP), SPIE Workshop "Validation in medical image registration", February 18, 2007. Invited by Pierre Jannin.
17. **Christensen, G.E.**, Topics in Medical Image Registration, Center for Imaging Science, April 17, 2007, Johns Hopkins University, MD. Invited by Laurent Younes.
18. **Christensen, G.E.**, Inverse Consistent Image Registration and Evaluation, MICCAI 2007 Workshop Statistical Registration: Pair-wise and Group-wise Alignment and Atlas Formation, Brisbane, Australia; November 2, 2007 Invited by Lilla Zollei.
19. **Christensen, G.E.**, Non-rigid Image Registration Evaluation Project (NIREP), Mathematical Methods for Medical Image Analysis (MMMIA), Nov. 4-9, 2007, Banff, Canada. Invited by Rafeef Abugharbieh and Ghassan Hamarneh.
20. **Christensen, G.E.**, Linear and Non-linear Registration, ISMRM 16th Annual Meeting, Toronto, Ontario, Canada, 3 – 9 May 2008. Invited by Mark Jenkinson and Dave Hawkes.
21. **Christensen, G.E.**, Image registration and spirometry for tumor tracking, ESTRO 27 – Goteborg, Sweden, 14 – 18 September 2008. Invited by Vincent Gregoire and Tommy Knöös.
22. **Christensen, G.E.**, Advances in Image registration, University of Copenhagen, Denmark. Nov 1, 2010. Invited by Marleen de Bruijne.
23. **Christensen, G.E.**, Advances in Image registration, University of Pennsylvania, Dec 8, 2010. Invited by Christos Davatzikos.
24. **Christensen, G.E.**, Lung Image Registration and Analysis, The 3rd International Summer School Biomedical Image Analysis Summer School: Modalities, Methodologies & Clinical Research, Institut Poincaré, Paris, July 6-10, 2015. Invited by Nikos Paragios.
25. **Christensen, G.E.**, Image Registration and Analysis, Department of Computer Science, College of Charleston, SC, March 19-22, 2016. Invited by Brent Munsell.
26. **Christensen, G.E.**, Session in Memory of Jean Pouliot: Next-Generation Deformable Image Registration (Advanced Medical Image Registration Techniques), 58th AAPM Annual Meeting, Washington, DC, July 31 - August 4, 2016. Invited by Geoff Hugo.
27. **Christensen, G.**E., Current- and Varifold-Based Lung Image Registration. Keynote speaker at the 2nd International Workshop on Patch-based Techniques in Medical Imaging (PatchMI 2016), Workshop at MICCAI 2016. Athens Greece, Oct 17, 2016. Invited by Brent Munsell.
28. **Christensen, G.**E., CT ventilation imaging via local expansion ratio and SSTVD image registration. Computed Tomography Ventilation Imaging Evaluation 2019 (CTVIE19) Grand Challenge at the American Association of Physicists in Medicine (AAPM) 2019 Annual Meeting. Invited by Bilal Tahir.

**Presentations:**

1. **Christensen, G.E.**, Miller, M.I., Amit, Y., Grenander, U. Global shape models for anatomical structures. 26th Conference on Information Sciences and Systems, Princeton University, March, 1992.
2. **Christensen, G.E.**, Miller, M.I. Deformable Anatomical Data Bases for MR, PET, and CT. Midwest Workshop in Iterative Image Reconstruction, University of Minnesota, VA Medical Center, September, 1992.
3. **Christensen, G.E.**, Miller, M.I. A Deformable Neuroanatomy Textbook. 1992 Visualization in Biomedical Computing Conference, University of North Carolina, Chapel Hill, October, 1992. Computer demonstration.
4. **Christensen, G.E.**, Miller, M.I., Vannier, M.W. A 3D deformable magnetic resonance textbook based on elasticity. 1994 Spring Symposium: Applications of Computer Vision in medical Image Processing, Stanford University, March, 1994.
5. Miller, M.I., **Christensen, G.E.** Brain Mapping Today, and into the Future ..., 1994 Midwest Workshop in Iterative Image Reconstruction, Washington University, St. Louis, MO, June, 1994.
6. **Christensen, G.E.** Individualized electronic craniofacial textbooks. The annual meeting of the American Cleft Palate-Craniofacial Association, Tampa, Florida, April, 1995.
7. **Christensen, G.E.**, Rabbit, R.D., Miller, M.I., Joshi, S.C., Grenander, U., Coogan, T., Van Essen, D.C. Topological properties of smooth anatomic maps. Proceedings of the 16th International Conference on Information Processing in Medical Imaging, Brest, France, June, 1995.
8. **Christensen, G.E.,** Miller, M.I., Marsh, J.L., Vannier, M.W. Automatic Analysis of Medical Images Using a Deformable Textbook. 1995 Computer Aided Radiology Conference, Berlin, Germany, June, 1995.
9. **Christensen, G.E.** A Deformable Atlas for Modeling Craniofacial Deformities. Workshop: Pattern-Theoretic Knowledge Representation, St. Louis, MO, April 18-19, 1996.
10. **Christensen, G.E.**, Kane, A.A., Marsh, J.L., Vannier, M.W. Synthesis of an Individualized Cranial Atlas with Dysmorphic Shape. Mathematical Methods in Biomedical Image Analysis, San Francisco, CA, June, 1996.
11. **Christensen, G.E.**, Kane, A.A., Marsh, J.L., Vannier, M.W. A 3D Deformable Infant CT Atlas, CAR '96: Computer Assisted Radiology, Paris, France, June, 1996.
12. **Christensen, G.E.**, Williamson, J.F., Chao, K.S.C., Miller, M.I., So, F.B., Vannier, M.W. Deformable Anatomical Templates for Brachytherapy Treatment Planning in Radiotherapy of Cervical Cancer, SPIE's 42nd Annual Meeting, Vision Geometry VI, San Diego, CA, July, 1997.
13. Vannier, M.W., **Christensen, G.E.**, Electronic Anatomic Atlases for Medical Imaging, American Association of Physicists in Medicine (AAPM) Annual Meeting, Milwaukee, WI, July, 1997.
14. Johnson, H.J., **Christensen, G.E.**, Haller, J.W., Melloy, J. Vannier, M.W. Synthesizing Average 3D Anatomical Shapes, Biomedical Engineering Seminar, Mayo Clinic, Rochester, MN, Oct., 1998.
15. **Christensen, G.E.**, Johnson, H.J., Haller, J.W., Melloy, J., Vannier, M.W., Marsh, J.L., Synthesizing average 3D anatomical shapes using deformable templates, Medical Imaging 1999: Image Processing, San Diego, CA, Feb., 1999.
16. Vannier, M.W., **Christensen, G.E.**, Rob, R., Napel, S., Advancements in Visualization, American Association of Physicists in Medicine (AAPM) Annual Meeting, Nashville, TN, July, 1999.
17. **Christensen, G.E.**, Consistent Image Registration, Workshop to honor Donald L. Snyder, Sachs Professor of Electrical Engineering, Washington University, St. Louis, MO, Jan., 2000.
18. **Christensen, G.E.,** Yin, P. Vannier, M.W., Chao, K.S.C., Dempsey, J.F., Williamson, J.F. Large-Deformation Image Registration using Fluid Landmarks, IEEE Southwest Symposium on Image, Austin, Texas, April, 2000.
19. **Christensen, G.E.**, He, J., Consistent Nonlinear Elastic Image Registration, IEEE Proceedings of Mathematical Methods in Biomedical Image Analysis, Kauai, Hawaii. Dec., 2001.
20. **Christensen, G.E.**, He, J., Large Deformation Inverse Consistent Elastic Image Registration, Information Processing in Medical Imaging, Ambleside, United Kingdom, July, 2003.
21. **Christensen, G.E.**, Inverse Consistent Medical Image Registration, Dept. of Electrical Engineering, The University of Southern California, Jan., 2005.
22. **Christensen, G.E.**, Regularized Nonrigid Registration of Lung CT Images by Preserving Tissue Volume and Vesselness Measure, Medical Image Analysis for the Clinic --- A Grand Challenge, Beijing, 2010.
23. **Christensen, G.E.**, Measurement of Local Deformation due to Lung Tumor Response to Radiation Therapy, Fifth International Workshop on Pulmonary Image Analysis, Sept 2013, Nagoya, Japan.
24. **Christensen, G.E.**, The Shape Collapse Problem in Volumetric Image Registration, MFCA2013 - 3rd MICCAI Workshop on Mathematical Foundations of Computational Anatomy, Sept 2013, Nagoya, Japan.
25. **Christensen, G.E.,** Nonrigid Image Registration with Equally Weighted Assimilated Surface Constraint, 6th International Workshop, WBIR 2014, London, UK, July 2014.
26. **Christensen, G.E.,** Healthy Aging and Internet of Things, Science Café, Mount Vernon, IA, Oct 2016.

 6.4 Other important facts or information

 (Research proposals submitted, new research programs under development, seminars

 presented, etc.)

1. 1R01RR15228-01 grant submission: Population Analysis via Consistent Image Registration, **G.E. Christensen (PI)**, October, 1999, priority score 221 and a percentile of 32.3. Not funded.
2. 1R01DE14162-01 grant resubmission: Morphometric Analysis via Consistent Image Registration, **G.E. Christensen (PI)**, July, 2000, priority score 238 and a percentile of 43.1. Not funded.
3. R01CA75371-05 grant resubmission: Image-based Dose Planning in Intracavetary Brachytherapy, **G.E. Christensen (subcontract PI)**, Sponsoring Agency: Washington University/NIH, July, 2001, priority score 242 and a percentile of 47. Not funded.
4. **Sabbatical** - University of Southern California. Took three short trips to USC to work with Richard Leahy, Anand Joshi, and Belma Dogdas during my sabbatical. (Spring 2005).
5. **22M:160 Introduction to Differential Geometry I**. Attended. Taught by Oguz Durumeric. (Fall 2007).
6. **22M:161 Introduction to Differential Geometry II**. Attended. Taught by Oguz Durumeric. (Spring 2008).
7. 1 RC1 EB011429-01 - Non-rigid Image Registration Evaluation Project for Lung Imagery: NIREP-LUNG, **G.E. Christensen (subcontract PI)**, Sponsoring Agency: NIH, April, 2009, Not funded.
8. **55:295 Optimal Filtering**. Attended. Taught by Soura Dasgupta. (Spring 2010).
9. **55:195 Techniques for Object and Image Recognition**. Attended. Taught by Ed Ratner. (Spring 2011).
10. **22M:132 General Topology**. Attended. Taught by Richard Randel. (Fall 2011).
11. **Sabbatical** - Florida State. Took three trips to Florida State to work with Anuj Strivastava, Eric Klassen, and Sebastian Kurtek during my sabbatical. (Fall 2011).
12. **22M:133 Introduction to Smooth Manifolds**. Attended. Taught by Charlie Frohman. (Spring 2012).
13. **22M:260 Differential Geometry I**. Attended. Taught by Oguz Durumeric. (Fall 2012).
14. **22M:261 Differential Geometry II**. Attended. Taught by Oguz Durumeric. (Spring 2013).
15. **22M:133 Introduction to Smooth Manifolds**. Attended. Taught by Charlie Frohman for second time. (Spring 2014).
16. **22M:260 Differential Geometry I**. Attended. Taught by Oguz Durumeric for second time. (Fall 2014).
17. **22M:261 Differential Geometry II**. Attended. Taught by Oguz Durumeric for second time. (Spring 2015).
18. **MATH:5000 Abstract Algebra I**. Attended. Taught by Muthu Krishnamurthy (Fall 2015)
19. **MATH:5010 Abstract Algebra II.** Attended. Taught by Muthu Krishnamurthy (Spring 2016)
20. **ECE:5820 Software Engineering Languages and Tools (SELT)**. Attended. Taught by Jon Kuhl (Fall 2017)
21. **ECE:5550 Internet of Things**. Attended. Taught by Jon Kuhl and Er-Wei Bai (Spring 2017)

 6.5 Research highlights (one paragraph)

I introduced the notion of consistent image registration to the medical imaging community in 1999. Consistent image registration reduces registration error by minimizing the error between the forward and reverse transformations between the two images. Although consistent image registration cannot guarantee a unique registration between two biological images, it does provide more biologically relevant correspondence mappings than the traditional unidirectional registration algorithms. The fundamental idea is relevant to all methods that require correspondence between two images, or a shape model and an image, or between two shape models, etc. This idea has been incorporated into many algorithms reported in the literature since the initial presentation. In collaboration with Michael I. Miller & Richard Rabbit, we were the first research group to perform 2D & 3D image registration using a fluid deformable model. In July 1996, three colleagues and I applied for a patent entitled "Method and Apparatus for Image Registration" which describes new algorithms for fast image registration. This patent describes improved high-dimensional, nonlinear image registration algorithms that can practically run on desktop workstations instead of supercomputers. I have been invited to give seven lectures, one of which resulted in an article in Science entitled "Computer Processing Gives Imaging a Sharper View", Science, 169 (5229), Sept. 1995, p. 1338 reporting on my research. In 1992, my research project was written up in an article in the Science News entitled "Brain Warping", Science News, 144 (24), Dec. 1993, pp. 392-394. In 1995, I presented a talk at the prestigious Information Processing in Medical Imaging conference and was awarded honorable mention for Franswa Ebbsman Prize.

7. Publications

 7.1 Books and monographs. (Limit to textbooks, research monographs, conference/

 symposium/congress proceedings, handbooks, etc., of which you are an author or an editor.

 Do not include articles or chapters in such media.)

**Books:**

1. **Christensen, G.E.** The design of a bit-serial coprocessor to perform multiplication and division on a massively parallel architecture. Electrical Engineering Masters Thesis, Washington University, St. Louis, December 1989.
2. **Christensen, G.E.** Deformable shape models for anatomy. Electrical Engineering D.Sc. Dissertation, Washington University, St. Louis, Missouri, August, 1994.
3. Leahy, R.M., Roux, C., **Christensen, G.E.**, Wilson, D.L. eds., Proceedings of the 2004 IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Arlington, VA, USA, April 15-18, 2004, IEEE, CDROM.
4. **Christensen, G.E.**, Sonka, M. eds. Information Processing in Medical Imaging: 19th International Conference, IPMI 2005, Glenwood Springs, CO, USA, July 10-15, 2005, Proceedings, Springer, Lecture Notes in Computer Science, LNCS 3565, 777 pages.
5. Benoit Dawant, **Gary E. Christensen**, J. Michael Fitzpatrick, Daniel Rueckert, Biomedical Image Registration: 5th International Workshop, WBIR 2012, Nashville, TN, USA, July 7-8, 2012, Proceedings, Springer, Lecture Notes in Computer Science, LNCS 7359, 320 pages

7.2 Articles in technical journals with rigorous review procedures. (Include notes,

 discussions, letters to editor, etc., which are published in such journals and those articles or

 chapters in a meeting's printed record if that record utilizes review procedures equivalent to

 those for archive journals.)

**Journal Papers:**

1. Miller, M.I., **Christensen, G.E.**, Amit, Y., Grenander, U. Mathematical textbook of deformable neuroanatomies. Proceedings of the National Academy of Sciences, December, 1993, 90(24), pp. 11944-11948.
2. **Christensen, G.E.**, Rabbit, R.D., Miller, M.I. 3D brain mapping using a deformable neuroanatomy. Physics in Medicine and Biology, March, 1994, (39) pp. 609-618.
3. **Christensen, G.E.**, Miller, M.I., Grenander, U., Vannier, M.W. Individualizing Neuroanatomical Atlases Using a Massively Parallel Computer. IEEE Computer, January, 1996, pp. 32-38.
4. Haller, J.W., **Christensen, G.E.,** Joshi, S.C., Newcomer, J.W., Miller, M.I., Csernansky, J.G., Vannier, M.W. Hippocampal MR Morphometry by Pattern Matching. Radiology, June 1996, (199) pp. 787-791.
5. **Christensen, G.E.**, Rabbit, R.D., Miller, M.I. Deformable Templates Using Large Deformation Kinematics. IEEE Transactions on Image Processing, 5(10), Oct 1996, pp. 1435-1447. PMID: 18290061.
6. Sheline, Y.I., Black, K.J., Lin, D,Y., **Christensen**, **G.E.,** Gado, M.H., Brunsden, B.S., and Vannier M.W. Stereological MRI Volumetry of the Frontal Lobe. Psychiatry Research: Neuroimaging, 67(3), Oct., 1996, pp. 203-214.
7. Vannier, M.W., Marsh, J.L., Wang G., **Christensen, G.E.**, and Kane, A.A. Surgical Imaging Systems. Surgical Technology International, 5, 1996, PMID: 15858714, pp. 35-42.
8. Haller, J.W., Banerjee, A., **Christensen, G.E.,** Gado, M., Joshi, S.C., Miller, M.I., Sheline, Y., Vannier, M.W., Csernansky, J.G. 3D Hippocampal Morphometry by High Dimensional Transformation of a Neuroanatomical Atlas. Radiology, 202(2), Feb 1997, pp. 504-510.
9. Kane, A.A., Lo, L.J., **Christensen, G.E.,** Vannier, M.W., Marsh, J.L. Relationship between Bone and Muscles of Mastication in Hemifacial Microsomia. Plastic and Reconstructive Surgery, 99, April, 1997, pp. 990-999.
10. Miller, M.I., Banerjee, A., **Christensen, G.E.**, Joshi, S.C., Khaneja, N., Grenander, U., Matejic, L. Statistical Methods in Computational Anatomy. Statistical Methods in Medical Research, vol. 6, June 1997, pp. 267-299.
11. **Christensen, G.E.**, Joshi, S.C., Miller, M.I. Volumetric Transformation of Brain Anatomy. IEEE Transactions on Medical Imaging. 16(6), Dec., 1997, pp. 864-877.
12. **Christensen, G.E.**, MIMD vs. SIMD Parallel Processing: A Case Study in 3D Medical Image Registration. Parallel Computing. Vol. 24, Jan 1998, pp. 1369-1383.
13. **Christensen,** G.E., Johnson, H.J., Consistent Image Registration, IEEE Transactions on Medical Imaging. 20(7), July 2001, pp. 568-582. PMID: 11465464
14. **Christensen, G.E.**, Carlson, B., Chao K.S.C., Yin, P., Grigsby, P.W., Nguyen, K., Dempsey, J.F., Lerma, F.A., Bae, K.T., Vannier, M.W., Williamson, J.F., Image-Based Dose Planning of Intracavitary Brachytherapy: Registration of Serial Imaging Studies using Deformable Anatomic Templates, International Journal of Radiation, Oncology, Biology, and Physics. 51(1), Jan 2001, pp. 227-243.
15. Perlyn, C.A., Marsh, J.L., Vannier, M.W., Kane, A.A., Koppel, P. Clark, K.W., **Christensen, G.E.**, Knapp, R., Lo L.J., Govier, D. The Craniofacial Anomalies Archive at St. Louis Children’s Hospital: 20 years of Craniofacial Imaging Experience. Plastic and Reconstructive Surgery. 108(7), Dec 2001, pp. 1862-1870.
16. Johnson, H.J., **Christensen, G.E.**, Consistent Landmark and Intensity-based Image Registration, IEEE Transactions on Medical Imaging, 21(5), May 2002, pp. 450-461.
17. **Christensen, G.E.**, Johnson, H.J., Invertibility and Transitivity Analysis for Nonrigid Image Registration, Journal of Electronic Imaging, 12(1) January, 2003, pp. 106-117.
18. Li, B., **Christensen, G.E.**, McLennan, G., Hoffman, E.A., Reinhardt, J.M., Establishing a normative atlas of the human lung: Inter-subject warping and registration of volumetric CT, Academic Radiology, 10(3) March, 2003, pp. 255-265. PMID: 19175115.
19. Magnotta, V.A., Bockholt, H.J., Johnson, H.J., **Christensen, G.E.**, Andreasen, N.C., Subcortical, Cerebellar and MR Based Consistent Brain Image Registration, NeuroImage, 19(2), June 2003, pp. 233-245.
20. Hellier, P., Barillot. C., Corouge, I., Gibaud, B., Le Boualher, G., Collins, L., Evans A., Malandain, G., Ayache N., **Christensen, G.E.**, Johnson, H.J., Retrospective Evaluation of Inter-subject Brain Registration, IEEE Transactions on Medical Imaging, 22(9), Sept 2003, pp. 1120-1130. PMID: 12956267.
21. Low, D.A., Nystrom, M., Kalinin, E., Parikh, P., Dempsey, J.F., Bradley, J.D., Wahab, S.H., Islam, T., **Christensen, G.E.**, Politte, D., Whiting, B., A Method for the Reconstruction of 4-Dimensional Gated CT Scans During Free Breathing, Medical Physics, 30(6), June 2003, pp. 1254-1263.
22. **Christensen, G.E.**, He, J., Dill, J.A., Rubinstein, J.T., Vannier, M.W., Wang, G., Automatic Measurement of the Labyrinth Using Image Registration and a Deformable Inner Ear Atlas, Academic Radiology, 10(9), Sept., 2003, pp. 988-999.
23. Hoffman, E.A., Clough, A.V., **Christensen, G.E.**, Lin, C.l., McLennan, G., Reinhardt, J.M., Simon, B.A., Sonka, M., Tawhai, M.H., van Beek, E.J.R., Wang, G. The comprehensive imaging-based analysis of the lung: A forum for team science, Academic Radiology, 11(12), Dec., 2004, pp. 1370-1380.
24. Lu, W., Parikh, P., El Naqa, I., Nystrom, M., Hubenschmidt, J., Wahab, S., Mutic, S., Sing, A., **Christensen, G.E.**, Bradley, J.D., Low, D.A., Quantitation of the four-dimensional computed tomography process for lung cancer patients, Medical Physics, 32(4), March 2005, pp. 890-901.
25. B.A. Simon, **G.E. Christensen**, D.A. Low, J.M. Reinhardt, Computed Tomography Studies of Lung Mechanics, Proc Am Thorac Soc, 2(6), Dec 2005, pp. 506-507, 517-521.
26. **Christensen, G.E.**, Johnson, H.J., Vannier, M.W., Synthesizing Average 3D Anatomical Shapes, NeuroImage, 32(1), Aug 2006, pp. 146-158.
27. Owen, B.D., **Christensen, G.E.**, Reinhardt, J.M., Ryken, T.C., Rapid prototype patient specific drill-template for cervical pedicle screw placement. Computer Aided Surgery. 2007 12(5):303-8.
28. **Christensen, G.E.**, Song, J.H., Lu, W., El Naqa, I., Low, D.A., Tracking Lung Motion with Inverse Consistent Image Registration. Med Phys. June 2007 34(6):2155-63.
29. Reinhardt, J.M., Ding, K., Cao, K., **Christensen, G.E.**, Hoffman, E.A., Bodas, S.V., Registration-based estimates of local lung tissue expansion compared to xenon-CT measures of specific ventilation, Medical Image Analysis, Dec 2008, 12:752-763.
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34. X Geng, **GE Christensen**, H Gu, TJ Ross, Y Yang, Implicit Reference-Based Group-wise Image Registration and Its Application to Structural and Functional MRI, NeuroImage, Available online April 14, 2009, PMID: 19371788.
35. K Ding, JE Bayouth, JM Buatti, **GE Christensen** and JM Reinhardt, 4DCT-Based Measurement of Radiation-Induced Changes in Pulmonary Function, Medical Physics, March 2010, 37(3):1261-1272. (additionally journal cover)
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37. R Amelon, K Cao, K Ding, **GE Christensen**, JM Reinhardt, ML Raghavan, Characterization of Regional Lung Deformation. Journal of Biomechanics, Three-dimensional characterization of regional lung deformation, J Biomechanics, Sep 2011, 44: 2489-2495.
38. K Murphy, B van Ginneken, JM. Reinhardt, S Kabus, K Ding, X Deng, K Cao, K Du, **GE Christensen**, et al., Evaluation of Registration Methods on Thoracic CT: The EMPIRE10 Challenge, IEEE Transactions on Medical Imaging, Nov 2011, 30:1901-1220.
39. K Du, JE. Bayouth, K Cao, **GE Christensen**, K Ding, JM Reinhardt, Reproducibility of Registration-Based Measures of Lung Tissue Expansion, Medical Physics, 39(3), 2012, 1595-1608.
40. K Ding, K Cao, MK. Fuld, K Du, **GE Christensen**, EA. Hoffman, JM Reinhardt, Comparison of Image Registration Based Measures of Regional Lung Ventilation from Dynamic Spiral CT with Xe-CT, Med. Phys. 39, 5084 (2012); http://dx.doi.org/10.1118/1.4736808
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44. S Balik, GD Hugo, E Weiss, N Jan, MN Roman, WC Sleeman, M Fatyga, **GE Christensen**, C Zhang, MJ Murphy, J Lu, P Keall, JF Williamson, Evaluation of Four-Dimensional Computed Tomography to Four-Dimensional Cone-Beam Computed Tomography Deformable Image Registration for Lung Cancer Adaptive Radiation Therapy International Journal of Radiation Oncology, Biology, Physics, 2013, 86(2):372-9.
45. S Kurtek, W Wu, **GE Christensen**, A Srivastava, Segmentation, Alignment and Statistical Analysis of Biosignals with Application to Disease Classification, Journal of Applied Statistics. 40(6), pp. 1270-1288, 2013.
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47. RE Amelon, K Cao, JM Reinhardt, **GE Christensen**, ML Raghavan, A Measure for Characterizing Sliding on Lung Boundaries, Annals of Biomedical Engineering, October 2013, DOI: 10.1007/s10439-013-0920-5.
48. M Fatyga, N Dogan, E Weiss, WC Sleeman IV, B Zhang, WJ Lehman, JF Williamson, K Wijesooriya, **GE Christensen**, A voxel-by-voxel comparison of deformable vector fields obtained by three deformable image registration algorithms applied to 4DCT lung studies. Frontiers in Oncology, Vol 5, 2015. doi: 10.3389/fonc.2015.00017.
49. CP Johnson, RL Follmer, I Oguz, LA Warren, **GE Christensen**, JG Fiedorowicz, V A Magnotta and JA Wemmie. Brain abnormalities in bipolar disorder detected by quantitative T1ρ mapping. Molecular Psychiatry (2015) 20, 201–206; doi:10.1038/mp.2014.157.
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53. CL Guy, E Weiss, N Jan, LB Reshko, **GE Christensen**, GD Hugo. Effect of Atelectasis Changes on Tissue Mass and Dose during Lung Radiotherapy. Med Phys. 2016, Med. Phys. 43, 6109 (2016); doi 10.1118/1.4965807, PMCID: PMC5085974 (additionally journal cover)
54. JJ Shaffer, CP Johnson, JG Fiedorowicz, **GE Christensen**, JA Wemmie, VA Magnotta. Impaired sensory processing measured by functional MRI in Bipolar disorder manic and depressed mood states, Brain Imaging and Behavior. July 2017, 1:11, doi 10.1007/s11682-017-9741-8, PMID: 28674759
55. PK Saha, D Jin, Y Liu, **GE Christensen**, C Chen. Fuzzy Skeletonization: Theory, Algorithms, and Applications, IEEE Transactions on Visualization and Computer Graphics, 2017 Aug. doi: 10.1109/TVCG.2017.2738023, PMID: 28809701
56. JJ Shaffer Jr, CP Johnson, JD Long, JG Fiedorowicz, **GE Christensen**, JA Wemmie, VA Magnotta. Relationship Altered Between Functional T1ρ and BOLD Signals in Bipolar Disorder. Brain Behav. Sept 2017. https://doi.org/10.1002/brb3.802
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58. CL Guy, E Weiss, **GE Christensen**, N Jan, GD Hugo. CALIPER: A Deformable Image Registration Algorithm for Large Geometric Changes during Radiotherapy for Locally-Advanced Non-Small Cell Lung Cancer. Medical Physics, March 2018. PMID:29603277, DOI: 10.1002/mp.12891
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7.4.1 Posters

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7.5 Other Technical publications (book and paper reviews, reports, theses, and dissertations).

1. **Christensen, G.E.**, Joshi, S.C., Wang, J. Miller, M.I. Deformable Brains. April, 1994. Videotape.
2. **Christensen, G.E.**, Haller, J.W., Walkup, R. Pathophysiology of Schizophrenia, February, 1995. Videotape.

7.6 Journal, publishers and research supporting agencies for whom you have reviewed papers, books or proposals in the past three years.

 IEEE Transactions on Medical Imaging, IEEE Transactions on Image Processing, Medical Image Analysis, Pattern Recognition Letters, Radiology, The Whitaker Foundation, Applied Mathematics Letters, Visualization in Biomedical Computing Conference 1996, IEEE Computer, National Science Foundation, National Institute of Health, The University of Iowa Biosciences Initiative Pilot Grant Program, The University of Iowa Carver Scientific Research Initiative Grant Program, Medical Physics, Oxford University Press, IEEE Transactions on Pattern Analysis and Machine Intelligence, Computer Vision and Image Understanding, International Workshop on Biomedical Image Registration.

7.7 Patents

1. Miller, M.I., **Christensen, G.E.**, Joshi, S.C., Grenander, U., Method and Apparatus for Image Registration, United States, patent number **6,009,212.** Issued 12/28/99.
2. Miller, M.I., Joshi, S.C., **Christensen, G.E.** Rapid Convolution Based Large Deformation Image Matching Via Landmark and Volume Imagery. United States, patent number **6,226,418**. Issued 5/1/01.
3. Miller, M.I., Joshi, S.C., **Christensen, G.E.** Rapid Convolution Based Large Deformation Image Matching Via Landmark and Volume Imagery. United States, patent number **6,408,107**. Issued 6/18/02.
4. **Christensen, G.E.** Method and Apparatus for Generating Consistent Image Registration. United States, patent number **6,611,615**. Issued 8/26/03.