

## Curriculum Vita for Gary E Christensen

Electrical and Computer Engineering (ECE) Department  
Phone: (319) 335-6055, e-mail: [gary-christensen@uiowa.edu](mailto:gary-christensen@uiowa.edu)

### 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

### Professional Experience

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 Compute 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	

### Scientific and Professional Societies

IEEE – Fellow (2018)  
AIMBE – Fellow (2022)  
AIAA – Fellow (2022)  
SPIE – Lifetime Member

### Honors, Prizes, and Awards

- 1) PhD student award: Di Wang, Dare to Discover Banner 2022.
- 2) Jia Xu, et al., International Society for Bipolar Disorders (ISBD) 2020 best poster award.
- 3) PhD student award: Yue (Amanda) Pan, Ada Louise Ballard and Seashore Dissertation Fellowship, Spring 2020.

- 4) PhD student award: Wei Shao, Ada Louise Ballard and Seashore Dissertation Fellowship, Spring 2019.
- 5) 2018-2019 Graduate College Outstanding Faculty Mentor Award – Mathematical, Physical Sciences & Engineering – Honorable Mention.
- 6) 1<sup>st</sup> and 3<sup>rd</sup> 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.
- 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) 1<sup>st</sup> 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.

### Consulting

6/21 – 9/23	PowerPollen
1996 - 1998	IntellX
1995-1996	Surgical Navigation Technologies

### Department Service Activities

9/22 – present	ECE Scholarship Committee
1/17 – present	ECE Undergraduate Committee
9/10 – 9/22	ECE Scholarship Committee, Chairman
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

### College Service Activities

12/21 – present College of Engineering Director of Undergraduate Studies Committee (DUGS)  
 1/06 – present Explore Engineering Day presenter.  
 5/98 – present College of Engineering Parent Orientation presenter.  
 8/19 – 5/22 College of Engineering Research Advisory Committee (Associate Dean of Research Advisory Board)  
 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.

### University Service Activities

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)  
 8/19 – present Member of the Iowa Initiative for Artificial Intelligence (IIAI)  
 9/19 – 2/20 General Education CLAS Core Review Committee (CCRC)  
 1/16 – 12/19 Member of the University of Iowa Informatics Initiative (UI3)  
 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)

### Community, State, National and International Service Activities

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

- 2023 **Reviewer**, Information Processing in Medical Imaging 2023, (IPMI 2023).
- 2022 **Co-Chair**, AAPM Working Group Meeting: Data Management, Image Processing, Planning Methods, and Clinical Trial Review for Functional Lung Avoidance RT, Washington DC. May 2022.
- 2022 **Reviewer**, International Conference on Medical Image Computing and Computer Assisted Intervention, (MICCAI 2022).
- 2022 **Reviewer**, Medical Imaging with Deep Learning (MIDL 2022).
- 2022 **Reviewer**, The 10th International Workshop on Biomedical Image Registration (WBIR 2022).
- 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)
- 2020 **Reviewer**, Medical Imaging with Deep Learning (MIDL 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**, 5<sup>th</sup> 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**, 4<sup>th</sup> International Workshop on Biomedical Image Registration, (WBIR 2010).
- 2009 **Program Committee Member**, 2<sup>nd</sup> 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**, 2<sup>nd</sup> 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 SSI AI 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**, 3<sup>rd</sup> 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, SSI AI 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.

### Courses Taught

Semester	Course Number	Course Title	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	86	Online
S'21	ENGR:2730	Computers in Engineering	3	53	Online
F'21	ENGR:2730	Computers in Engineering	3	77	Laptop classroom
S'22	ENGR:2730	Computers in Engineering	3	28	Laptop classroom
F'22	ENGR:2730	Computers in Engineering	3	82	Laptop classroom
S'23	ENGR:2730	Computers in Engineering	3	27	Laptop classroom
F'23	ENGR:2730	Computers in Engineering	3	96	Laptop classroom
S'24	ENGR:2730	Computers in Engineering	3	61	Laptop classroom

#### 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 – 5/23, Image Registration for SPIROMICS, **Ph.D. May 2023**.
13. Mahsa Rijabi, 1/24 – present.

## 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**.

## 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 images Thesis 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.
31. Mattison Flakus, Thesis supervisor: John Bayouth
32. Broderick Schwartz, Thesis supervisor: Tyler Bell
33. Anjum, Md Fahim, Thesis supervisor: Joseph M. Reinhardt.

### **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.

### **Undergraduate Student Project Supervision**

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,

### Supervision of Postdoctoral Associates

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

### Teaching Awards and Nominations

Date	Title	Grantor	Selection Process	Nominee <sup>1</sup>
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
2022	7th annual Student Supervisor of the Year Award on The University of Iowa campus	University of Iowa Pomerantz Career Center	Graduate Student nomination	Nominated
2023	The President & Provost Award for Teaching Excellence, University of Iowa	University of Iowa	University of Iowa Council on Teaching	Nominated

## Other Contributions to Teaching

- 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.

**Principal Investigator on contracts and/or grants**

Contract or Grant Title	Sponsor	Start and End Date	Budget (yearly)	Acct. No.	Percent Credit
Encoding and manipulating medical images using quantum computers (Christensen, PI)	OVPR, Univ of Iowa	7/22 to 6/23	\$25,000	Jumpstarting Tomorrow Community Feasibility Grant Program	33%
Comprehensive modeling and mitigating radiation induced lung injury following radiation therapy for lung cancer. (Bayouth, Wisconsin PI, Christensen MPI)	NIH/NCI	N/A	\$340,595 (Iowa portion)	R01CA272252 Would have been funded but the proposal was withdrawn 10/22 by Wisconsin: (11th percentile)	50%
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%

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

Contract or Grant Title	Sponsor	Start and End Date	Budget	Acct. No.	Percent Credit
Suicidality in Bipolar and Major Depression Disorders (Magnotta PI)	NIH	9/1/22 to 6/30/27	\$488,443	MH125838	5%
Lung Biomechanics and Disease Progression in SPIROMICS (Reinhardt PI)	NIH	8/18 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 Pulmonary Function 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%

#### 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.

29. **Christensen, G.E.**, Elastic and Fluid Image Registration Methods. Image Guided Cancer Therapy Research Program (IGCT) at MD Anderson Cancer Center. 2022. Invited by Kristy Brock.
30. **Christensen, G.E.**, Lifelong Learning. HKN (EE) and UPE (Computing) Honors Society Induction Ceremony. West Point, 2024. Invited by COL Jim Raftery.

#### **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.

#### **Courses Attended since becoming an ECE Faculty member at Iowa.**

1. **22M:160 Introduction to Differential Geometry I.** Attended. Taught by Oguz Durumeric. (Fall 2007).
2. **22M:161 Introduction to Differential Geometry II.** Attended. Taught by Oguz Durumeric. (Spring 2008).
3. **55:295 Optimal Filtering.** Attended. Taught by Soura Dasgupta. (Spring 2010).
4. **55:195 Techniques for Object and Image Recognition.** Attended. Taught by Ed Ratner. (Spring 2011).
5. **22M:132 General Topology.** Attended. Taught by Richard Randel. (Fall 2011).
6. **22M:133 Introduction to Smooth Manifolds.** Attended. Taught by Charlie Frohman. (Spring 2012).
7. **22M:260 Differential Geometry I.** Attended. Taught by Oguz Durumeric. (Fall 2012).

8. **22M:261 Differential Geometry II.** Attended. Taught by Oguz Durumeric. (Spring 2013).
9. **22M:133 Introduction to Smooth Manifolds.** Attended. Taught by Charlie Frohman for second time. (Spring 2014).
10. **22M:260 Differential Geometry I.** Attended. Taught by Oguz Durumeric for second time. (Fall 2014).
11. **22M:261 Differential Geometry II.** Attended. Taught by Oguz Durumeric for second time. (Spring 2015).
12. **MATH:5000 Abstract Algebra I.** Attended. Taught by Muthu Krishnamurthy (Fall 2015)
13. **MATH:5010 Abstract Algebra II.** Attended. Taught by Muthu Krishnamurthy (Spring 2016)
14. **ECE:5820 Software Engineering Languages and Tools (SELT).** Attended. Taught by Jon Kuhl (Fall 2017)
15. **ECE:5550 Internet of Things.** Attended. Taught by Jon Kuhl and Er-Wei Bai (Spring 2017)
16. **ECE:5995 Quantum Engineering: Computing and Devices.** Attended. Taught by Fatima Toor (Fall 2021)
17. **ECE:5995 Software Security.** Attended. Taught by Hans Johnson (Spring 2022)
18. **ECE:5995 Generative AI Tools: ChatGPT and Beyond.** Attended. Taught by Tyler Bell (Fall 2023).

## Research highlights.

I have worked in the field of medical image analysis and algorithms for over 30 years. I am an IEEE fellow, AIMBE fellow, AAIA fellow, and a lifetime member of SPIE. My major contributions to the field have been in the areas of image registration algorithms, analysis, and evaluation. My colleagues and I introduced the concepts of fluid image registration and inverse consistent image registration. Over my career, I have worked with collaborators from Medical School Departments including Surgery, Radiology, Radiation Oncology, Internal Medicine, and Psychiatry to apply image registration techniques to real medical applications. These applications include building electronic atlases, computing shape statistics, and tracking radiation dose.

## Publications

### 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., Brunsten, 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.
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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.
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**Patents**

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