DEBASIS MITRA

Department of Computer Engineering & Sciences
Florida Institute of Technology
dmitra@fit.edu

EDUCATION

Ph.D.	Computer Science	May 1994	Center for Advanced Computer Studies The University of Louisiana at Lafayette (ULL)
Ph.D.	Physics	May 1984	Indian Institute of Technology (IIT) Kharagpur, India
M.Sc.	Physics	May 1977	IIT, Kharagpur, India

PROFESSIONAL EXPERIENCE

Academic Positions

2009–present	Professor, Department of Computer Engineering & Sciences Florida Institute of Technology (FIT), Melbourne, Florida
2001-2009	Associate Professor, Department of Computer Sciences, FIT
1999-2001	Associate Professor (Tenured), Dept. of Computer Science, Jackson State University (JSU), Jackson, Mississippi
1994-1999	Assistant Professor (Tenure track), Dept. of Comp. Science, JSU

Research Visits

2022	Visiting Fulbright-Nehru Scholar, Indian Statistical Institute-Kolkata
2018	Visiting Professor in Mathematics, Stanford University, CA
2009–present	Affiliated Scientist, Dept. Radiotracer Development and Imaging Technology, Lawrence Berkeley National Lab (LBNL), CA
2008	1. Indian Institute of Technology, Mumbai, India 2. Tata Institute of Fundamental Research, Mumbai, India
2007	Oxford University, Constraint Reasoning Lab, U.K.
2002	1. Vienna Technical University, Vienna, Austria 2. Asian Institute of Technology, Bangkok, Thailand
2001	Linkoping University, AI Lab, Sweden
2000-2001	Invited Professor, Univ. of Paris-South, CNRS/LIMSI Lab, France

Industry Positions

1982-89	Oil & Gas Corp., India (Sr. Geophysicist, Petroleum exploration)
2017-2021	SolvingDynamics, Inc., California (Chief Scientific Officer and Co-founder; Medical image analyses)

PROFESSIONAL LINKS

Home Page:	https://cs.fit.edu/~dmitra
ORCID link:	https://orcid.org/0000-0002-4351-1252
Google Scholar:	https://scholar.google.com/citations?user=NhlPH-8AAAAJ&hl=en Listed publications: 112, Citation: 606, h-index: 12, i10-index: 12
ResearchGate:	https://www.researchgate.net/profile/Debasis-Mitra-4 RG Score: 22.08, h-index (excluding self-cite): 12, 72.5% percentile Research Interest: 359.4, Citations: 593
MyNCBI Profile:	https://www.ncbi.nlm.nih.gov/myncbi/debasis.mitra.1/bibliography/public/
LinkedIn Profile:	https://www.linkedin.com/in/debasis-mitra-632a837/

AWARD

- **Fulbright Academic & Professional Excellence Award (Research)**. Host Inst. Indian Statistical Institute, Kolkata, India, (awarded in 2020, the visit is scheduled after pandemic closure in 2022)
- **Outstanding Faculty Award for Research and Teaching** (HEADWAE, from the State Legislature of Mississippi, 2001)

CURRENTLY FUNDED PROJECTS

- NEH Research and Development Program (UEI: WNN6VH618X58, Workspace ID: WS00893916) "Ancient Script Digitization and Archival (ASDA) of Indus Valley Artifacts using Deep Learning," 8/1/2023-7/31/2023, $74,980.38.
- National Institute of Health (R15 EB030807-A01): "Increasing clinical access by reducing scan-time of dynamic nuclear cardiac imaging with superior diagnosis." 2021-2024, $455,104.
- National Science Foundation (CNS-2016818, PI: Marc Baarmand): "MRI: Acquisition of a High-Performance GPU/CPU Cluster for Research and Innovation in Computational Sciences and Engineering," 2020-2023, approximately $570,000.

SELECTED FINISHED FUNDED PROJECTS

- Univ. of California San Francisco: "Machine learning patient outcomes." 2018-2022, $33,886.
- Univ. of California San Francisco: "Feature extraction from PET-CT." 2016-2018, $28,702.
- National Institute of Health: "Energy-Independent Single Photon Molecular Imaging Technology," a subcontract from the UCSF, 2013-2018, $63,584.
- National Institute of Health: "Molecular Imaging of Cardiac Hypertrophy using MicroPET and Pinhole SPECT Project," a subcontract from LBNL, 2012-2013, $46,042.
- National Institute of Health: "Designing and Maintaining Nuclear Medicine Database," a subcontract from LBNL, 2010-2012, $26,648.
- National Science Foundation (NSF, IIS-0732566): "Creativity in Physics: SGER," 2007-2009, $99,331.
- Department of Homeland Security (DNDO): "Muon Radiography for Nuclear Contraband Detection," 2007-2010, as Co-PI (PI: Dr. M. Hohlman, Department of Physics and Space Sciences, FIT), $228,705, 2007-08, and $571,453 for 2008-09.
- National Science Foundation (NSF, IIS-0296042): " CAREER award: Temporal/Multi-dimensional Reasoning with Uncertainty," 1998-2002, approximately $300,000.
- NASA Glenn (formerly, Lewis) Research Center: "System Definition and Object-Oriented Programming for a Rocket Engine Numerical Simulation," NCC3-437, 10/23/1995 – 12/31/1999, $284,267. "Intelligent Interface to the Numerical Simulators (IINS) of Aerospace Transportation Engines," NCC3-2277, 7/22/1999 – 8/1/2001, $35,032.

JOURNAL SUBMISSION (PRESENT)

- Chang H., Kobzarenko V., and Mitra D. (revision submitted, January 2023) "Inverse Radon Transform with Deep Learning: an application in cardiac motion correction." *IEEE Transactions in Image Processing.*
- Wenhui He*, Tianling Ou*, Nickolas Skamangas, Charles C. Bailey, Naomi Bronkema, Yan Guo, Yiming Yin, Valerie Kobzarenko, Xia Zhang, Andi Pan1, Xin Liu, Ava E. Allwardt, Debasis Mitra, Brian Quinlan, Rogier W. Sanders, Hyeryun Choe, and Michael Farzan. "Heavy-chain CDR3-engineered B cells facilitate in vivo evaluation of HIV-1 vaccine candidates". *Submitted to the Science* journal, 2022.

JOURNAL PUBLICATIONS

- Sawant, SM., Kosak, K., Li, K., Avachat, SS., Perlman, ES., and Mitra. D. "JetCurry I. Reconstructing Three-Dimensional Jet Geometry from Two-Dimensional Images". arXiv:2210.03033v. *Astronomy and Computing* (Elsevier). Available online 17 September 2022, 100653.
- G Liu, D Mitra, M Poon, MA Zapala, WC Temple, KT Vo, KK Matthay and Y Seo. "Incorporating Radiomics into Machine learning models to predict outcomes of neuroblastoma". *J Digit Imaging*. 2022 Jun;35(3):605-612. doi: 10.1007/s10278-022-00607-w. Epub 2022 Mar 2. PMID: 35237892; PMCID: PMC9156639.
- Liu, G., Mitra, D., Poon, M., Zapala, M.A., Temple, W.C., Vo, K.T., Matthay, K.K., Mitra, D., Seo, Y.S. (2022) "Multi-modal PET-MRI radiomic analyses with machine learning over breast tumor pheonotypes." *Jnl Digit Imaging,* https://doi.org/10.1007/s10278-022-00607-w
- Liu, G., Mitra, D., Jones, E.F. *et al.* (2021) "Mask-Guided Convolutional Neural Network for Breast Tumor Prognostic Outcome Prediction on 3D DCE-MR Images." *Jnl Digit Imaging* **34**: 630–636. https://doi.org/10.1007/s10278-021-00449-y

- Gengbo Liu, Youngho Seo, Debasis Mitra, and Benjamin L. Franc. (2018) “Unique and important big-data radiomics features in multimodal medical imaging using machine learning techniques.” *Book Chapter in “Big-data in Medical Imaging,” Eds. Suganya R., Rajaraman S., and Abdullah AS., CRC Press.* ISBN-10: 9781138557246
- Mitra D, Abdala M, Boutchko R, Chang H, Srestha U, Botvinick E, Seo Y, and Gullberg GT. (2018) "Comparison of Sparse Domain Approaches for 4D SPECT Dynamic Image Reconstruction.” *Medical Physics,* **45**(10):4493-4509. doi: 10.1002/mp.13099.
- Huang S-y, Franc BL, Harnish R, Liu G, Mitra D, Copeland TP, Arasu VA, Kornak J, Jones EF, Behr S, Hylton NM, Price ER, Esserman L, Seo Y. (2018) “Exploration of PET and MRI radiomic features for decoding breast cancer phenotypes and prognosis.” *Nature Partners Journal Breast Cancer*, Article number: **24**. https://www.nature.com/articles/s41523-018-0078-2
- Pan H, Chang H, Mitra D, Gullberg GT, and Seo Y. (2017) “Sparse domain approaches in dynamic SPECT imaging with high-performance computing.” *American Journal of Nuclear Medicine and Molecular Imaging*, **7**(6):283-294.
- Mitra D, Abdala M, Boutchko R, Chang H, Srestha U, Botvinick E, Seo Y, and Gullberg GT. (2018) "Comparison of Sparse Domain Approaches for 4D SPECT Dynamic Image Reconstruction.” *Medical Physics*, **45**(10):4493-4509. doi: 10.1002/mp.13099
- Boutchko R, Mitra D, Baker S, Jagust W, and Gullberg GT. (2015) “Clustering Initiated Factor Analysis (CIFA) Application for Tissue Classification in Dynamic Brain PET.” *Journal of Cerebral Blood Flow & Metabolism – Nature*, **35**(7):1104-11. doi:10.1038/jcbfm.2015.69.
- Abdalah M, Boutchko R, Mitra D, and Gullberg GT. (2015) “Reconstruction of 4-D Dynamic SPECT Images From Inconsistent Projections Using a Spline Initialized FADS Algorithm (SIFADS).” *IEEE Transactions in Medical Imaging*, **34**(1): 216-228.
- Gnanvo K, Grosso LV, Hohlman M, Locke JB, Quintero A, and Mitra D. (2011) “Imaging of high-Z material for nuclear contraband detection with a minimal prototype of a muon tomography station based on GEM detectors.” *Nuclear Instruments and Methods in Physics Research A*, **652**: 16–20.
- Mitra D, and Launay F. (2012) "Explanation Generation over Temporal Interval Algebra." Chapter 8 in '*Qualitative Spatio-Temporal Representation and Reasoning: Trends and Future Directions*.' Hazarika SM. (Editor), pp. 273-283, Information Science Reference (IGI Global), Hershey, PA. ISBN: 1616928689.
- Hohlman M, Ford P, Gnanvo K, Helsby J, Pena D, Hoch R, and Mitra D. (2009) “GEANT4 Simulation of a Cosmic Ray Muon Tomography System with Micro-Pattern Gas Detectors for the Detection of High-Z Materials,” *IEEE Transactions on Nuclear Science*, **56**(3):1356-1363.
- Hoch R, Mitra D, Hohlman M, and Gnanvo K. (2009) “Muon Tomography Algorithms for Nuclear Threat Detection.” *Lecture Notes in Artificial Intelligence*, Series: “Next-Generation Applied Intelligence.” Chien BC, Hong TP, Chen SM, and Ali M. (Eds) Springer Verlag, **214**: 225-231.
- Mitra D. (2008) “Three generations of research in computational creativity and beyond,” in *Association for Advancement of Artificial Intelligence Tech Report on Creative Intelligent Systems*. Ventura D, Maher ML, and Colton S (Eds.).
- Mitra D, Samant G, Sengupta K. (2006) “Correlogram-based method for comparing biological sequences.” *Springer Lecture Notes in Artificial Intelligence*, Series: “Advances in Applied Artificial Intelligence**,”** Ali M, and Dapoigny R. (Eds.) Springer Verlag, **4031**: 953-961. ISBN 3-540-35453-0.
- Tandon G, Chan PK, and Mitra D. (2006) “Data cleaning and enriched representations for anomaly detection in system calls.” Chapter in *Machine Learning and Data Mining for Computer Security: Methods and Applications*, Maloof M. (Ed.), pp. 137-156, Springer, London. Doi:10.1007/1-84628-253-5_9
- Launay FM, and Mitra D. (2005) “Incrementally scheduling with qualitative temporal information,” *Lecture Notes in Computer Science, Series: Innovations in Applied Artificial Intelligence*, Springer **3533**:229-231.
- Renz J., Mitra D. (2004) “Qualitative Direction Calculi with Arbitrary Granularity.” In: Zhang C., W. Guesgen H., Yeap WK. (eds) *PRICAI 2004*: Trends in Artificial Intelligence. *Lecture Notes in Computer Science*, Springer, Berlin, Heidelberg **3157**: 65-74. Doi: 10.1007/978-3-540-28633-2_9
- Ligozat G, Mitra D, Condotta JF. (2004) “Spatial and Temporal Reasoning: Beyond Allen's Calculus.” *AI Communications (European journal on Artificial Intelligence)*, **17**(4):223—233.

- Tandon G, Mitra D, Chan PK. (2004) “Motif-oriented Representation of Sequences for a Host-based Intrusion Detection System.” *Springer Lecture Notes in Computer Science*, *Series: Innovations in Applied Artificial Intelligence*, **3029**:605-615. Orchard R, Yang C, and Ali M. (Eds) ISBN 3-540-22007-0
- Abecker A, and seventeen other organizers of all the Spring symposia. (2003) “2003 AAAI Spring Symposia series.” *AI Magazine*, **24**(3):131-134.
- Mitra D, and Ligozat G. (2002) “Spatial-reasoning for Agents in Multiple Dimensions,” Debasis and Gerard Ligozat, *Jnl. of Universal Computer Science*, **8**(8): 774-791.
- Mitra D, and Bond P. (2002) **"**Component-oriented Programming as an AI-planning Problem," *Lecture Notes in Computer Science, Series: Developments in Applied Artificial Intelligence*, 2358:567-574. Hendtlass T, and Ali M. (Eds.) Springer . ISBN 3-540-67689-9.
- Mitra D. (2002) "A path consistent singleton modeling (CSM) algorithm for arc-constrained networks," *Applied Intelligence Journal*, 17(2): 313-318.
- Mitra D. (2001) "Interactive Modeling for Batch Simulation of Engineering Systems as a Constraint Satisfaction Problem," *Lecture Notes in Computer Science*, *Series: Engineering of Intelligent Systems*, Monostori L, Váncza J, and Ali M. (Eds.) Springer **2070**. ISBN 3-540-42219-6.
- Guesgen HW, and Mitra D. (1999) "A multiple-platform decentralized route finding system." *Springer Lecture Notes in Computer Science*, *Series: Multiple Approaches to Intelligent Systems*, 1611:707-713. Imam IF, Kodratoff Y, El-Dessouki A, and Ali M. (Eds.) Springer, Berlin, Heidelberg, **1611**:707-713. Doi:10.1007/978-3-540-48765-4_75
- Mitra D, and Pal N. (1999) "Complexity studies of a temporal constraint propagation algorithm: A statistical analyses," *Journal of Experimental and Theoretical Artificial Intelligence*, **11**:155-183.
- Mitra D. (1998) "Cluster Forming Interval Sub-algebras," *CONSTRAINT journal,* **3**:179-189.
- Mitra D, and Loganantharaj R. (1996) "Experimenting with a Temporal Constraint Propagation Algorithm," *Applied Intelligence Journal*, **6**(1): 39-48.
- Basu D, and Mitra D. (1981) "The Lorentz group in oscillator realization III - the group SO(3,1)," *Journal of Mathematical Physics*, **22**(5): 946-953.
- Basu D, and Mitra D. (1980) "The Lorentz group in oscillator realization II - the group SO(3,1)," *Journal of Mathematical Physics*, **21**(4): 636-637.

PEER REVIEWED COMPUTER SCIENCE CONFERENCE PROCEEDINGS

- Somrita Bakshi, Sarbani Palit, Ujjwal Bhattacharya, Nushrat Hussain, Debasis Mitra, and Kimia Gholami. “A novel CNN-based approach for distinguishing between COVID and common pneumonia”. Submitted to the *IVCNZ 2022* (37th International Conference on Image and Vision Computing New Zealand), 2022.
- Launay FM, and Mitra D. (2007) “Efficient Consistency Checking and Explanation Generation over some Maximal Tractable Interval Subalgebras,” *International Joint Conference on Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, Hyderabad, India.
- Launay FM, and Mitra D. (2006) “On-line Qualitative Temporal Reasoning with Explanation,” *Proceedings of the Nineteenth International Florida AI Research Society (FLAIRS-2006) conference*, Melbourne, Florida.
- Tandon G, Mitra D, and Chan PK. (2004) “MORPHEUS - Motif Oriented Representations to Purge Hostile Events from Unlabeled Sequences,” *ACM Conference on Computer and Communication Security*, *Workshop notes on Visualization and Data Mining for Computer Security*, Washington D.C., pp. 16-25. https://doi.org/10.1145/1029208.1029212
- Tandon G, Chan P, and Mitra D. (2006) “Data cleaning and enriched representations for anomaly detection in system calls.” *Proc. of Machine Learning and Data Mining for Computer Security*, pp. 137-156.
- Silaghi M, and Mitra D. (2004) "Technique for distributed constraint satisfaction and optimization with privacy enforcement," *IEEE/WIC/ACM IAT-2004 (Intelligent Agent Technology) conference,* Beijing, China.
- Launay FM, and Mitra D. (2004) “Problem of Detecting the "Culprit" Conflicting Constraints in Temporal Reasoning,” *Association for the Advancement of Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, San Jose, California.

- Kim HR, and Mitra D. (2004) "An Efficient Heterogeneous Hybrid Algorithm for Constraint Satisfaction Search," *Proc. 17th International FLAIRS conference*, Miami Beach, Florida.
- Mitra D. (2004) “Modeling and Reasoning with Star Calculus: An Extended Abstract.” *Proc. Eighth International Symposium on AI and Math*, Ft. Lauderdale, Florida.
- Ligozat G, Mitra D, and Condotta JF. (2003) "Spatial and Temporal Reasoning: Beyond Allen's Calculus," *Proc*. *AAAI Spring Symposium on Foundations and Applications of Spatio-temporal Reasoning (FASTR)*, *AAAI Technical Report SS-03-03*, The AAAI Press, Menlo Park, California.
- Kim HR, and Mitra D. (2003) "A Spatial Knowledge Representation Scheme: Star Calculus." *International Joint Conference on Artificial Intelligence (IJCAI), Workshop notes on Spatial and Temporal Reasoning,* Acapulco, Mexico.
- Mitra D. (2002) "Representing Geometrical Objects by Relational Spatial Constraints," *Proc. International conference on Knowledge-based Computing Systems (KBCS),* Mumbai, India.
- Mitra D. (2002) "Star Algebra for Reasoning with Angular Directions in 2D-space," *Association for Advancement of Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, Edmonton, Canada.
- Mitra D. (2002) "A class of star-algebras for point-based qualitative reasoning in two-dimensional space." *Proc. 15th International FLAIRS conference*, Pensacola Beach, Florida. .
- Mitra D, and Ligozat G. (2001) "A technique to detect tractable sub-languages in some spatio-temporal constraint languages." *International Joint Conference on Artificial Intelligence, Workshop notes on “Agents with spatio-temporal reasoning.”*
- Mitra D, Ligozat G, and Hossein L. (2001) "Modeling of multi-dimensional relational constraints between point objects." *Proc. 14th International FLAIRS conference*, Key West, Florida.
- Malluhi Q, Mitra D, Alhalabi B, and Hamza MK. (2000) "Turning chaos into order: a critical evaluation of web-based technologies." *Proc. The WebNet: World Conference on the WWW and Internet*, San Antonio, Texas.
- Mitra D. (1999) "The consistent singleton modeling (CSM) algorithm for any domain." *International Joint Conference on Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, Stockholm, Sweden.
- Anger FD, Mitra D, and Rodriguez RV. (1999) "Satisfiability in nonlinear time: algorithms and complexity." *Proc. 13th International FLAIRS conference*, Orlando, Florida.
- Mitra D. (1998) "All Consistent Temporal Models for Hybrid Representation of Temporal Entities." *Proc. International Conference on Information Technology (CIT)*, Bhubaneswar, India.
- Anger FD, Mitra D, and Rodriguez RV. (1998) "Temporal Constraint Networks in Nonlinear Time." *The 13th European Conference on Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, Brighton, UK.
- Bernholdt DE; Fox GC; Malluhi Q; Markowski R; McCracken N; Mitra D; Podgorny M; Scavo T. (1998) "Synchronous Learning at a Distance: Experiences with TANGO." *Proc. Supercomputing'98 conference*, Orlando, Florida.
- Mitra D, Babu U, Earla AK, and Hemminger JA. (1998) "Expert System Architecture for A Simulation Package." *International Conference on Mathematical Problems in Engineering, Aerospace and Sciences conference - AI Track*, Daytona Beach, Florida..
- Bhalla PN, Pratap V, Reddy P, and Mitra D. (1998) "An object model for a rocket engine numerical simulator." *NASA University Research Centers - Technical Conference* (URC-TC), Huntsville, Alabama.
- Mitra D, and Brown W. (1997) "Two orthogonal sub-algebras of interval algebra." *Proc*. *10th International conference on Innovations in Applied Artificial Intelligence*, Atlanta, Georgia.
- Mitra D. (1997) "Multi-dimensional knowledge representation with a fuzzy extension." *The annual Fourteenth conference of American Association of Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning at AAAI*, Providence, New Hampshire.
- Mitra D. (1997) "Identifying patterns in interval constraint networks." *The Fifteenth International Joint Conference on. Artificial Intelligence, Workshop on Spatial and Temporal Reasoning*, Nagoya, Japan**.**
- Mitra D. (1996) "Causal and Containment Sub-algebras of Interval Algebra." *The Fourteenth annual conference of American Association of Artificial Intelligence, Workshop on Spatial and Temporal Reasoning*, Portland, Oregon*.*
- Nathan W, Campbell E, Al-Gharab M, Johnson D, Schoolar R, Winters F, and Mitra D. (1996) "An

Expert System for Recognizing Plants from External Features." *Proc. ESRI User's Conference*, Palm Springs, California.

- Shoshani A, Preston P, Jacobsen J, and Mitra D. (1996) "Characterization of Temporal Sequences in Geophysical Databases." *Proc. Eighth IEEE Statistical and Scientific Database Management (SSDBM) conference*, Sweden.
- Mitra D, and Jung GS. (1995) "Spatial Invariance Issues in Logical Representation of Images." *Fourteenth International Joint Conference on Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning*, Montreal, Canada.
- Mitra D. (1995) "Theoretical and practical implications of an algorithm for finding all consistent temporal models." *Proc. 8th FLAIRS conference*; also in *Proc. TIME-95 Workshop* (independently reviewed with permission).
- Mitra D. (1994) "Some theoretical and experimental studies of temporal constraint satisfaction problem." *Proc. The Twelfth Annual conference of American Association of Artificial Intelligence*, Seattle, Washington.
- Mitra D, and Loganantharaj R. (1994) "Weak-consistency in interval constraint network." *Twelfth Annual conference of American Association of Artificial Intelligence, Workshop notes on Spatial and temporal reasoning,* Seattle, Washington.
- Mitra D, Pal N, and Loganantharaj R. (1994) "Statistical analyses of experimental data on temporal 3-consistency problem." *Twelfth Annual conference of American Association of Artificial Intelligence, Workshop notes on Experimental Evaluation of Reasoning and Methods,* Seattle, Washington.
- Mitra D, Srinivasan P, Gerard ML, and Hands AE. (1994) "A possibilistic interval constraint problem: Fuzzy temporal reasoning." *Proc. 1994 IEEE 3rd International Fuzzy Systems Conference (Fuzz-IEEE)*, Vol. 2, pp. 1434-1439, Orlando, Florida. Doi: 10.1109/FUZZY.1994.343607
- Mitra D, and Loganantharaj R. (1994) "An efficient and approximate algorithm for temporal reasoning." *Proceedings of the Seventh International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems*, Austin, Texas.
- Loganantharaj R, and Mitra D. Giambrone S. (1994) "An efficient algorithm for incremental temporal constraint propagation." *Proc. 7th International FLAIRS Conference*, Pensacola Beach, Florida.
- Mitra D, and Loganantharaj R. (1994) "Finding all feasible plans using temporal reasoning." *Proc. Conference on Intelligent Robotics in Field, Factory, Services and Space (CIRFFSS-94)* organized by the *American Institute of Aeronautics and Astronautics and NASA*, Clearwater, Texas.
- Mitra D, and Loganantharaj R. (1993) "Experimenting with a temporal constraint propagation algorithm." *The Thirteenth International Joint Conference on Artificial Intelligence, Workshop notes on Spatial and Temporal Reasoning,* Annecy, France.
- Loganantharaj R, and Mitra D. (1991) "Consistent singleton models for temporal constraint network." *Proc. IEEE International Conference on Robotics and Automation (R&A-IEEE-91)*, Niece, France.
- Mitra D, and Loganantharaj R. (1990) "Unified framework to combine time points and intervals." *Proc. Third International Symposium on AI*, Monterrey, Mexico.
- Sen RK, and Mitra D. (1987) "A logic based response analyzer for computer aided learning." *Proc. The IEEE International Symposium on Electronic Devices, Circuits, and Systems*, Kharagpur, India.

RECENT CONFERENCE PRESENTATIONS (2015-Present)

- Chang, H., Kobzarenko, V., Smith, R., Paisey, S., and Mitra, D. “Affine Motion Correction Using Deep Learning.” *IEEE Nuclear Sc. Symp. And Med. Imag.* Conf., Yokohama, Japan, October 2021.
- Kobrachenko, V., Al-Rawe, I., Akhbardeh, A., Sagreiya, H., El-Kaffas, A., Rubin, D., Lutz, A., Mitra, D.. “Non-negative matrix factorization to detect heterogeneity in tumors from contrast enhanced dynamic ultrasound (DCEUS) images.” *World Mol. Imag. Conf.*, Prague, Check Republic, October 2020.

- Silaghi, M-D., Bi, R., Al-rawe, I., Seo, Y., and Mitra, D. “Topology-based Whole-body Multi-organ CT Image Segmentation.” IEEE Nuclear Sc. Symp. And Med. Imag. Conf., Boston, October 2020.
- Chang, H., Smith, R., Paisey, S., Boutchko, R., and Mitra, D. “Deep Learning Image Transformations under Radon Transform.” *IEEE Nuclear Sc. Symp. And Med. Imag. Conf*., Boston, October 2020.
- Chang H, Mitra D., […], and Seo Y. "Motion estimation and motion-corrected reconstruction with inverse Radon transformation using deep learning." Winter conference of *Soc. of Nucl. Med. and Mol. Imag*., Tampa, FL, 2020.
- Kobzarenko V, Mitra D, Al-Rawe1 I, Akhbardeh A, Sagreiya H, El-Kaffas A, Rubin D, Lutz A. "Applying Self-Organizing Map to dynamic 3D CEUS data on mice with heterogenous cancer." Winter conference of *Soc. of Nucl. Med. and Mol. Imag*., Tampa, FL, 2020.
- Kobrachenko, V, et al. (2019) “Contrast enhanced ultrasound (CEUS) 4D image analysis with time series shapes.” *Early detection of Cancer*, Stanford University, September, 2019.
- Kobzarenko, V, Mitra, D, Akhbardeh, A, Sagreiya, H, El-Kaffas, A, Rubin, D, and Lut, A. "Clustering time series data from heterogenous cancer types visualized by 3D CEUS Bolous." *World Molecular Imaging Congress*, Montreal, Canada, September 2019.
- Cisek, D, Fruchet, O, Kurian, R, LeBreton, T, Marquez K, and Mitra D. "Processing And Interpretation Of EEG Motor Imagery For Device Control With Deep Learning." Annual Conference of *Biomed. Eng. Soc.*, Philadelphia, October 2019.
- Liu, G., Mitra, D., Poon, M., Zapala, M., Temple, K., Matthay, K., and Seo, Y. "Radiomics-based machine learning model versus convolutional neural network model on neuroblastoma prognostic outcomes prediction." ID: GA528. *World Molecular Imaging Congress*, Montreal, Canada, September 2019.
- Liu, G., Mitra, D., Jones, E.F., Franc, B.L., Behr, S.C., Price, E.R., Joe, B., Esserman, L., Hylton, N.M., and Seo, Y. "Mask-guided convolutional neural network for breast tumor prognostic outcome prediction on 3D DCE-MR images." ID: GA524. *World Molecular Imaging Congress*, Montreal, Canada, September 2019.
- Chang H., Sreshtha U., Seo Y., Gullberg G.T., Mitra D. “Parameters Estimation Directly from Sinograms with Neural Networks.” *IEEE Nuclear Science Symposium and Medical Imaging Conference*, Manchester, U.K., October, 2019.
- Liu G., S.-y. Huang, B. Franc, Y.Seo., and D. Mitra “Unsupervised Learning in PET Radiomics.” *Proc. IEEE Nuclear Science Symposium and Medical Imaging Conference*, Atlanta, GA, 2017.
- Huang S-Y., Lee J.H., Pan H., Boutchko R., Shrestha U., Gullberg G.T., Mitra D., Yao Y., and Seo Y. “High Performance Fully 3D and 4D Image Reconstruction in SPECT Using a Big Data Analytic Tool Running on a Supercomputer*.” The 13th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine (Fully-3D)*, Newport, Rhode Island, USA, 2015.

SAMPLE INVITED TALKS

- Biomedical Engineering, FIT, October 2021.
- Indian Statistical Institute, Calcutta, India, March 2019
- Visvabharati University, Santiniketan, India, March 2019
- Biological Sciences, FIT, November 2019
- Stanford Medical School, California, November 2018
- Stanford Mathematics department, California, September 2018
  arXiv, http://arxiv.org/abs/1812.02580
- University of Haifa, Haifa, Israel, Summer 2016
- Technion, Haifa, Israel, Summer 2016

GRADUATE STUDENT MENTORING

- Haoran Chang, Ph.D. candidate (expected graduation July 2023) Dissertation topic: Deep Learning-Based SPECT Tomographic Reconstruction.
- Valerie Kobzarenko, Ph.D. student, Dissertation area: Application of non-negative matrix factorization in medical imaging.”
- Gengbo Liu, Ph.D. (December 2019) Dissertation topic: Cancer Prognosis from Medical Images with Machine Learning. (Scientist at Genentech Research & Development, California)

- Haoran Chang, MS (August 2016) Thesis topic: Studies with Dynamic Nuclear Imaging Image Reconstruction Algorithm. Continued to Ph.D.
- Hui Pan, Ph.D. (August 2015) Dissertation topic: Parallelization of Iterative Reconstruction Algorithms in Medical Imaging. (Tencent Corp., China)
- Mahmoud Abdalah, Ph.D. (December 2014) Dissertation topic: Novel Optimization Algorithm for Dynamic Imaging in SPECT. (Scientist at Moffitt Cancer Center, Tampa, Florida.)
- Stephen Johnson, Ph.D. (December 2014) Dissertation topic: Statistical Analysis of Protein Structure Comparison Algorithms and Metrics. (Computer Science Faculty Member at the Eastern Florida State College, Melbourne, Florida.)
- Florent Launay, Ph.D. student (un-finished) Dissertation topic: Detecting Inconsistent Sub-network in a Temporal Interval Constraint Network. (Microsoft, Seattle.)
- Bo Li, MS (May 2015) Thesis topic: 4D Segmentation in Sparse Domain using Wavelet Basis Functions.
- Shi Chen, MS (May 2015) Thesis topic: Comparison of Primal-Dual algorithm with Some Iterative Reconstruction Algorithms in Medical Imaging.
- Antall Fernandes, MS (December 2011) Thesis topic: REMI Database: A Data Management System for Nuclear Medicine Studies.
- Daniel Eiland, MS (May 2013) Thesis topic: SinoCor: A Tool for Motion Correction in Cardiac SPECT.
- Richard Hoch, MS (May 2011) Thesis topic: Advances in Cosmic Ray Muon Tomography Reconstruction Algorithms. (Software engineer, General Dynamics, Florida.)
- Gandhali Samant, MS (May 2006) Thesis topic: Correlogram Method for Comparing Bio-Sequences. (Engineering Manager, Microsoft, Mumbai, India.)
- Keith Ledig, MS (May 2006) Thesis Topic: Protein Folding Secondary Structure Prediction: Homology and Partitioning.
- Sung-Hoon Park, MS (December 2006) Thesis topic: Measurement Techniques for Comparing Fixed Length DNA Sequences.
- Michael Smith, MS (December 2003) Thesis topic: Digital Signal Processing Techniques in The Prediction of Protein Secondary Structures.

SAMPLE UNDERGRADUATE RESEARCH

- Banerjee A., from Computer Science (CS) at IIT Kharagpur as Summer intern, *Simulation Study of Muon Scattering for Tomographic Reconstruction*, *Conf*. *Record of the IEEE Nuclear Science Symposium and Medical Imaging Conf.,* 2009.
- Day K., a dual major in CS and Physics at FIT. *A Volume Clearing Algorithm for Muon Tomography, Conf. Record of the IEEE Nuclear Science Symposium,* 2014.
- Heath C, and Al-Ameen J., from CS at FIT, other students from Electrical Engineering and Biomedical Engineering (BME). Senior Design Project: *ASPIS: A smart-phone based device for detecting brain seizure from EEG*, 2017-18.
- Cisek D., and four others from Biomedical Eng. and CS at FIT. Senior Design Project: *EEG-controlled wheelchair,* (conference presentation at Biomed Eng. Soc.'19), 2018-19.

INTELLECTUAL PROPERTY

- Boutchko R., and Mitra D (2018) "CIFA – Cluster Initiated Factor Analysis." *US Patent Disclosure.*
- Mitra D, Eiland D, Boutchko R, and Gullberg GT. (2013) "SinoCor: Sinogram Level Motion Correction in SPECT." *Lawrence Berkeley National Laboratory Software License CR-3016*, 2013.

ADDITIONAL SCHOLASTIC ACTIVITIES

- Online Free Text (2019): "*C++ Lecture Notes*," cs.fit.edu/~dmitra/Cplus/CplusplusNotes.pdf.
- Online Free Text (2016): "*Algorithmics: A Text on Algorithms and Analysis*," cs.fit.edu/~dmitra/Algorithms/Algorithmics.pdf.

TEACHING

Courses Taught:

Artificial Intelligence
Design and Analysis of Algorithms
Formal Languages and Automata Theory
Discrete Mathematics

	Databases
Courses Developed:	Computational Virology: A Machine-Learning Perspective
	Temporal Databases
	Constraint-based Reasoning
	Computational Molecular Biology
	Pattern Recognition in Medical Imaging
	Scientific Computation
Courses Under-development:	Topological Data Analysis
	Quantum Computing

ADDITIONAL PROFESSIONAL ACTIVITIES

Organizer:

General Co-Chair, (with Dr. Philip K. Chan, FIT), The Nineteenth FLAIRS conference (originally Florida AI Research Society), 2006

Co-organizer, Association for Advancement of Artificial Intelligence Spring Symposium: *Foundations and Applications of Spatio-temporal Reasoning* (*FASTR*), Stanford, 2003

Reviewing Activities (Sample):

Applied Intelligence Journal, review-board member (Springer)
Machine Vision and Applications Journal (Springer)
Journal of AI Research (Open access peer-reviewed journal)
IEEE Transactions on Nuclear Science
Journal of Molecular Biology
Grant proposals, as a panel-member**,** NSF
Grant proposals, as a panel-member**,** NASA

Conference Program Committees (Sample):

Florida AI Research Symposium (FLAIRS)
TIME Conference
International Conference on Industrial Applications of AI (IEA*/*AIE)

Academic Committee Activities (Sample):

FIT: University faculty promotions Committee, College of Engineering faculty promotions Committee, College of Engineering's Research Council, Computer Science (CS) faculty Recruitment Committee, CS Graduate student recruitment committee, and Graduate Comprehensive Exam Committee.

JSU: CS graduate committee, CS undergraduate curriculum committee, School of Engineering's Associate Dean Recruitment committee, Computer Engineering Department's faculty recruitment committee.

Outreach Activities:

Judge to *Science Fairs* (1998-2004): Jackson, Mississippi; Melbourne, Florida
Event organizer (1996-99): Mississippi Science Olympiads

MEMBERSHIPS

IEEE, Computer Society
Association of Computing Machinery (ACM)
Association for Advancement of Artificial Intelligence (AAAI)
International Society for Optics and Photonics (SPIE)
American Heart Association
Phi Kappa Phi Honor Society