

# MUHAMMAD SAAD SHAMIM

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## EDUCATION

Baylor College of Medicine, Houston, TX May 2024  
Doctor of Medicine  
USMLE STEP 1 251 (8/2018)

Rice University, Houston, TX May 2023  
Doctor of Philosophy, Bioengineering  
Dissertation: Building a 3D genome atlas of human tissues down to base-pair resolutions  
Advisors: Erez Lieberman Aiden Ph.D., Aviva Presser Aiden M.D./Ph.D.

Rice University, Houston, TX May 2014  
B.S. Computer Science with minor in Biochemistry and Cell Biology  
B.A. Computational and Applied Mathematics  
B.A. Cognitive Sciences

## HONORS AND AWARDS

Medical Student Award, American Society for Clinical Pathology 2023  
Clinical Honors, General Pathology, Baylor College of Medicine 2023  
Clinical Honors, Internal Medicine Sub-Internship, Baylor College of Medicine 2023  
First place oral speaker award, BCM MSTP Symposium 2022  
Team Contribution Award, Nuclear Architecture Working Group, 2021  
2021 NIH Encyclopedia of DNA Elements (ENCODE) Consortium Meeting  
Finalist, Hertz Fellowship, Fannie and John Hertz Foundation 2019  
Selected nationally as 1 of 41 finalists for the PhD fellowship  
Fellow, Paul and Daisy Soros Fellowship for New Americans 2018 – 2020  
Selected nationally as 1 of 30 fellows to be awarded the \$90,000 fellowship  
Clinical Honors, Internal Medicine, Baylor College of Medicine 2018  
Invited Speaker, Bio-IT World Conference & Expo, Cambridge Innovation Institute 2017  
NASA Prize, TMCx Global Health Hackathon 2015  
Reality Hacker VR App Recognition (IamCardboard VR Blog) 2015  
Top Ten Must-Have Apps for Google Cardboard 2015  
Top Five Unique VR Apps 2015  
NCEMSF Video of the Year 2014  
Rice University Outstanding Senior Award 2014  
Rice University Spirit of Service Award 2014  
Baker College Fellow 2014  
NCEMSF Website of the Year 2014  
Hamner Engineering Scholarship 2013  
Baker College Outstanding Service Award 2013  
Rice University VIGRE Ambassador 2012 – 2013

## Peer-Reviewed Publications

Martin Houlard\*, Erin E Cutts\*, **Muhammad S Shamim**, Jonathan Godwin, David Weisz, Aviva Presser Aiden, Erez Lieberman Aiden, Lothar Schermelleh, Alessandro Vannini, Kim Nasmyth. MCPH1 inhibits condensin II during interphase by regulating its SMC2-kleisin interface. *eLife* 2021.  
Anjali Kaushal\*, Giriram Mohana\*, Julien Dorier\*, Isa Özdemir, Arina Omer, Pascal Cousin, Anastasiia Semenova, Michael Taschner, Oleksandr Dergai, Flavia Marzetta, Christian Iseli, Yossi Eliaz, David

- Weisz, **Muhammad Saad Shamim**, Nicolas Guex, Erez Lieberman Aiden, Maria Cristina Gambetta. CTCF loss has limited effects on global genome architecture in *Drosophila* despite critical regulatory functions. *Nature Communications* 2021.
- Xiaotian Zhang\*, Mira Jeong\*, Xingfan Huang\*, Xue Qing Wang, Xinyu Wang, Wanding Zhou, **Muhammad S Shamim**, Haley Gore, Pamela Himadewi, Yushuai Liu, Ivan D Bochkov, Jaime Reyes, Madison Doty, Yung-Hsin Huang, Haiyoung Jung, Emily Heikamp, Aviva Presser Aiden, Wei Li, Jianzhong Su, Erez Lieberman Aiden, Margaret A Goodell. Large DNA methylation nadirs anchor chromatin loops maintaining hematopoietic stem cell identity. *Molecular Cell* 2020.
- Yu Zhang\*, Xuefei Zhang\*, Zhaoqing Ba, Zhuoyi Liang, Edward W. Dring, Hongli Hu, Jiangman Lou, Nia Kyritsis, Jeffrey Zurita, **Muhammad S. Shamim**, Aviva Presser Aiden, Erez Lieberman Aiden, Frederick W. Alt. The fundamental role of chromatin loop extrusion in physiological V(D)J recombination. *Nature* 2019.
- Nathan Lawlor, Eladio J. Marquez, Peter Orchard, Narisu Narisu, **Muhammad Saad Shamim**, Asa Thibodeau, Arushi Varshney, Romy Kursawe, Michael R. Erdos, Matt Kanke, Huiya Gu, Evgenia Pak, Amalia Dutra, Sheikh Russell, Xingwang Li, Emaly Piecuch, Oscar Luo, Peter S. Chines, Christian Fuchberger, Praveen Sethupathy, Aviva Presser Aiden, Yijun Ruan, Erez Lieberman Aiden, Francis S. Collins, Duygu Ucar, Stephen C.J. Parker, Michael L. Multiomic Profiling Identifies *cis*-Regulatory Networks Underlying Human Pancreatic  $\beta$  Cell Identity and Function. *Cell Reports* 2019.
- Rachel E. Gate\*, Christine S. Cheng\*, Aviva P. Aiden, Atsede Siba, Marcin Tabaka, Dmytro Lituiev, Ido Machol, M. Grace Gordon, Meena Subramaniam, **Muhammad Shamim**, Kendrick L. Hougen, Ivo Wortman, Su-Chen Huang, Neva C. Durand, Ting Feng, Philip L. De Jager, Howard Y. Chang, Erez Lieberman Aiden, Christophe Benoist, Michael A. Beer, Chun J. Ye, Aviv Regev. Genetic determinants of co-accessible chromatin regions in activated T cells across humans. *Nature Genetics* 2018.
- Laura Vian\*, Aleksandra Pękowska\*, Suhas SP Rao\*, Kyong-Rim Kieffer-Kwon\*, Seolkyoung Jung\*, Laura Baranello, Su-Chen Huang, Laila El Khattabi, Marei Dose, Nathanael Pruett, Adrian L Sanborn, Andres Canela, Yaakov Maman, Anna Oksanen, Wolfgang Resch, Xingwang Li, Byoungkoo Lee, Alexander L Kovalchuk, Zhonghui Tang, Steevenson Nelson, Michele Di Pierro, Ryan R Cheng, Ido Machol, Brian Glenn St Hilaire, Neva C Durand, **Muhammad S Shamim**, Elena K Stamenova, José N Onuchic, Yijun Ruan, Andre Nussenzweig, David Levens, Erez Lieberman Aiden, Rafael Casellas. The Energetics and Physiological Impact of Cohesin Extrusion. *Cell* 2018.
- Peter A. Larsen\*, R. Alan Harris\*, Yue Liu, Shwetha C. Murali, C. Ryan Campbell, Adam D. Brown, Beth A. Sullivan, Jennifer Shelton, Susan J. Brown, Muthuswamy Raveendran, Olga Dudchenko, Ido Machol, Neva C. Durand, **Muhammad S. Shamim**, Erez Lieberman Aiden, Donna M. Muzny, Richard A. Gibbs, Anne D. Yoder, Jeffrey Rogers, Kim C. Worley. Hybrid de novo genome assembly and centromere characterization of the gray mouse lemur. *BMC Biology* 2017.
- Suhas S.P. Rao, Su-Chen Huang, Brian Glenn St. Hilaire, Jesse M. Engreitz, Elizabeth M. Perez, Kyong-Rim Kieffer-Kwon, Adrian L. Sanborn, Sarah E. Johnstone, Gavin D. Bascom, Ivan D. Bochkov, Xingfan Huang, **Muhammad S. Shamim**, Jaeweon Shin, Douglass Turner, Ziyi Ye, Arina D. Omer, James T. Robinson, Tamar Schlick, Bradley E. Bernstein, Rafael Casellas, Eric S. Lander, Erez Lieberman Aiden. “Cohesin Loss Eliminates All Loop Domains.” *Cell* (2017): 305–320.
- Douglas H. Phanstiel\*, Kevin Van Bortle\*, Damek V. Spacek, Gaelen T. Hess, **Muhammad S. Shamim**, Ido Machol, Michael I. Love, Erez Lieberman Aiden, Michael C. Bassik, Michael P. Snyder. “Static and Dynamic DNA Loops form AP-1-Bound Activation Hubs during Macrophage Development.” *Molecular Cell* (2017): 1037–1048.
- Olga Dudchenko, Sanjit S. Batra\*, Arina D. Omer\*, Sarah K. Nyquist, Marie Hoeger, Neva C. Durand, **Muhammad S. Shamim**, Ido Machol, Eric S. Lander, Aviva Presser Aiden, Erez Lieberman Aiden. “De novo assembly of the *Aedes aegypti* genome using Hi-C yields chromosome-length scaffolds.” *Science* (2017): 92-95.

- Emily M. Darrow, Miriam H. Huntley, Olga Dudchenko, Elena K. Stamenova, Neva C. Durand, Zhuo Sun, Su-Chen Huang, Adrian L. Sanborn, Ido Machol, **Muhammad Shamim**, Andrew P. Seberg, Eric S. Lander, Brian P. Chadwick, Erez Lieberman Aiden. “Deletion of DXZ4 on the human inactive X chromosome alters higher-order genome architecture.” *PNAS* (2016): 4504–4512.
- Neva C. Durand\*, **Muhammad S. Shamim\***, Ido Machol, Suhas S.P. Rao, Miriam H. Huntley, Eric S. Lander, and Erez Lieberman Aiden. “Juicer Provides a One-Click System for Analyzing Loop-Resolution Hi-C Experiments.” *Cell Systems* 3 (2016): 95-98.
- Neva C. Durand\*, James T. Robinson\*, **Muhammad S. Shamim**, Ido Machol, Jill P. Mesirov, Eric S. Lander, and Erez Lieberman Aiden. “Juicebox Provides a Visualization System for Hi-C Contact Maps with Unlimited Zoom.” *Cell Systems* 3 (2016): 99-101.
- Jennifer Young, Sevtap Ozisik, Beatrice Riviere, and **Muhammad Shamim**. “A comprehensive mathematical framework for modeling intestinal smooth muscle cell contraction with applications to intestinal edema.” *Mathematical Biosciences* 262 (2015): 206-213.

### Publications in Preparation

- Muhammad S. Shamim\***, Ragini Mahajan\*, ENCODE Consortium, et al. “An atlas of nuclear architecture resolves element-to-element chromatin loops in over 60 human tissues.” *In Preparation*.
- Muhammad S Shamim\***, Kyle Xiong\*, ENCODE Consortium, et al. “Charting the landscape of genome subcompartments in ENCODE cell types.” *In Preparation*.
- Muhammad S. Shamim\***, Neva C. Durand\*, ENCODE Consortium, et al. “Straw makes it possible to visualize and analyze large Hi-C datasets without downloading large files.” *In Preparation*.

### Preprints

- Marcela Sandoval Velasco\*, Olga Dudchenko\*, Juan Antonio Rodríguez\*, Cynthia Perez Estrada\*, Marianne Dehasque, Claudia Fontseré, Sarah S.T. Mak, Valeri Plotnikov, Ruqayya Khan, David Weisz, Vinícius G. Contessoto, Antonio B. Oliveira Junior, Achyuth Kalluchi, Sanjit S. Batra, **Muhammad S. Shamim**, Neva C. Durand, Brendan O’Connell, Richard E. Green, Beth Shapiro, Alfred L. Roca, Andreas Gnirke, Isabel Garcia-Treviño, Rob Coke, Joseph P. Flanagan, Kelcie Pletch, Aurora Ruiz-Herrera Moreno, Eric S. Lander, Jordan Rowley, José N. Onichic, Love Dalén, Marc A. Marti-Renom, M. Thomas P. Gilbert, Erez Lieberman Aiden. Three-dimensional genome architecture persists in a 52,000 year old woolly mammoth skin sample. *bioRxiv* 2023
- Benjamin C. Hitz, Jin-Wook Lee, Otto Jolanki, Meenakshi S. Kagda, Keenan Graham, Paul Sud, Idan Gabdank, J. Seth Strattan, Cricket A. Sloan, Timothy Dreszer, Laurence D. Rowe, Nikhil R. Podduturi, Venkat S. Malladi, Esther T. Chan, Jean M. Davidson, Marcus Ho, Stuart Miyasato, Matt Simison, Forrest Tanaka, Yunhai Luo, Ian Whaling, Eurie L. Hong, Brian T. Lee, Richard Sandstrom, Eric Rynes, Jemma Nelson, Andrew Nishida, Alyssa Ingersoll, Michael Buckley, Mark Frerker, Daniel S Kim, Nathan Boley, Diane Trout, Alex Dobin, Sorena Rahmanian, Dana Wyman, Gabriela Balderrama-Gutierrez, Fairlie Reese, Neva C. Durand, Olga Dudchenko, David Weisz, Suhas S. P. Rao, Alyssa Blackburn, Dimos Gkoutaroulis, Mahdi Sadr, Moshe Olshansky, Yossi Eliaz, Dat Nguyen, Ivan Bochkov, **Muhammad S Shamim**, Ragini Mahajan, Erez Aiden, Tom Gingeras, Simon Heath, Martin Hirst, W. James Kent, Anshul Kundaje, Ali Mortazavi, Barbara Wold, J. Michael Cherry. The ENCODE Uniform Analysis Pipelines. *bioRxiv* 2023
- Alyssa Blackburn, Christoph Huber, Yossi Eliaz\*, **Muhammad S Shamim\***, David Weisz, Goutham Seshadri, Kevin Kim, Shengqi Hang, Erez Lieberman Aiden. Cooperation among an anonymous group protected Bitcoin during failures of decentralization. *arXiv* 2022
- Olga Dudchenko, **Muhammad S. Shamim\***, Sanjit Batra\*, Neva C. Durand, Nathaniel T. Musial, Ragib Mostofa, Melanie Pham, Brian Glenn St Hilaire, Weijie Yao, Elena Stamenova, Marie Hoeger, Sarah K. Nyquist, Valeriya Korchina, Kelcie Pletch, Joseph P. Flanagan, Ania Tomaszewicz, Denise McAlouse, Cynthia Pérez Estrada, Ben J. Novak, Arina D. Omer, Erez Lieberman Aiden. The Juicebox Assembly Tools module facilitates de novo assembly of mammalian genomes with chromosome-length scaffolds for under \$1000. *bioRxiv* 2018.

Elena K Stamenova\*, Neva Durand\*, Olga Dudchenko, **Muhammad S Shamim**, Su-Chen Huang, Yiqun Jiang, Ivan D Bochkov, Suhas S. P. Rao, Eric S Lander, Andreas Gnirke, Erez Lieberman Aiden. The Hi-Culfit assay reveals relationships between chromatin contacts and DNA methylation state. *bioRxiv* 2018.

Olga Dudchenko, Melanie Pham, Christopher Lui, Sanjit Singh Batra, Marie Hoeger, Sarah K Nyquist, Neva C Durand, **Muhammad S Shamim**, Ido Machol, William Erskine, Erez Lieberman Aiden, Parwinder Kaur. Hi-C yields chromosome-length scaffolds for a legume genome, *Trifolium subterraneum*. *bioRxiv* 2018.

Mira Jeong\*, Xingfan Huang\*, Xiaotian Zhang\*, Jianzhong Su, **Muhammad Shamim**, Ivan Bochkov, Jaime Reyes, Haiyoung Jung, Emily Heikamp, Aviva Presser Aiden, Wei Li, Erez Aiden, Margaret A. Goodell. A cell type-specific class of chromatin loops anchored at large DNA methylation nadirs. *bioRxiv* 2017.

### **Patent Application**

**Muhammad Saad Shamim**, Suhas Surya Pilibail Rao, Ido Machol, and Erez Lieberman Aiden. “Altered Vision via Streamed Optical Remapping.” Patent Application. PCT US2015/048150.

### **TALKS**

**Muhammad Shamim**. “Resolving element-to-element DNA loops in human tissues.” BCM MSTP Symposium. Navasota, TX. September 2022.

**Muhammad Shamim**. “ENCODE’s Hi-C analysis pipeline enables high-resolution analysis of nuclear architecture on individual homologs.” ENCODE 2022 Consortium Meeting. Virtual. March 2022.

Jim Robinson, **Muhammad Shamim**, Surag Nair. “Accelerating analysis and visualization of Hi-C data with Straw.” Interactive Figures Panel. ENCODE 2022 Consortium Meeting. Virtual. March 2022.

Ritambhara Singh, **Muhammad Shamim**. “Nuclear Architecture Working Group Update: Model-n-Predict Subgroup.” ENCODE 2021 Consortium Meeting. Virtual. January 2021.

**Muhammad Shamim**. “Exploring ENCODE Hi-C data with Juicebox and Juicebox.js.” ENCODE 2019: Research Applications and Users Meeting. Seattle, WA. July 2019.

**Muhammad Shamim\***, Cassandra Diep\*, Mathews John\*. Exploring Career Clusters: Health & Sciences. Rice Career Development Panel. Houston, TX. March 2019.

**Muhammad Shamim\***, Mollie Ahn\*, Devonne Harris\*. Medical School Interest Panel. Rice EMS. Houston, TX. January 2019.

Idan Gabdank\* and **Muhammad Shamim\***. Overview of the Juicer and Juicebox ecosystem for Hi-C data analysis and visualization. ENCODE Consortium Meeting. Potomac, MD. January 2019.

**Muhammad Shamim**. “The 3D Genomics Software Ecosystem.” International Human Epigenome Consortium Assay Standards Call. Online. January 2019.

**Muhammad Shamim**. “Journey to the Center of the Nucleus: Exploring 3D Genomic Datasets with Juicebox.” Bio-IT World Conference & Expo (Invited Talk). Boston, MA. May 2017.

Sayan Bhattacharya and **Muhammad Shamim**. “The HathiTrust+Bookworm Project as a Model for Collaborative Research at Large Scale” in the panel “Developing and Sustaining Collaborative Research in the Humanities.” 131st Annual Convention of the Modern Language Association. Austin, TX. January 2016.

**Muhammad Shamim**. “Quantifying Cultural Trends: Big Data and Society.” Andrew W. Mellon Graduate Research Seminar – “The Quantified Self: A Techno-Human Experiment” at Rice University (Invited Lecture). Houston, TX. January 2016.

**Muhammad Shamim**. “New Frontiers in Biological Data Visualization.” University of St. Thomas Bioinformatics Colloquium (Invited Lecture). Houston, TX. October 2015.

**Muhammad Shamim**. “Culturomics: New Developments in Analyzing Digitized Texts.” Rice University Digital Humanities Group (Invited Lecture). Houston, TX. November 2015.

**Muhammad Shamim**. “The Future of Human Vision: Preferential Augmentation Using GPUs.” NVIDIA GPU Technology Conference. San Jose, CA. March 2015.

Grace Apfeld\*, Elizabeth Binswanger\*, Gregory Kamback\*, and **Muhammad Shamim\***. “Virtual Reconstruction of Historical Cities: Songo Mnara UNESCO Site.” Chevron Visualization Laboratory. Houston, TX. May 2014.

**Muhammad Shamim\*** and Pakorn Wongwaitayakornkul\*. “A Non-Invasive Diagnostic Tool for Cardiac Pressure Gradients.” Rice Computational & Applied Mathematics. Houston, TX. May 2014.

### POSTERS

**Muhammad S. Shamim\***, Ragini Mahajan\*, Saul Godinez\*, Suhas Rao, Olga Dudchenko, Neva Durand, Alyssa Blackburn, Dimos Gkountaroulis, Moshe Olshansky, Paul Sud, Idan Gabdank, Huiyi Gu, David Weisz, Aviva Presser Aiden, Erez Lieberman Aiden, others from the Aiden Lab and ENCODE. DNA folding maps across the human body. BCM MSTP Symposium. Houston, TX. March 2022

**Muhammad S. Shamim\***, Alyssa Blackburn\*, Yossi Eliaz\*, Dat Nguyen, Anish Ganti, Dimos Gkountaroulis, Ivan Bochkov, Daniel Aguila, Zoey Ling, Sharon Sun, David Weisz, Neva C. Durand, Erez Lieberman Aiden, Aviva Presser Aiden. DELTA: Deep Ensemble Learning Targeting Annotations in Hi-C 3D Genome Maps. BCM MSTP Symposium. Houston, TX. March 2021

**Muhammad Shamim\***, Neva C. Durand\*, James T. Robinson\*, Olga Dudchenko, Ido Machol, Douglass Turner, Helga Thorvaldsdóttir, David Weisz, Marie Hoeger, Zulkifl Gire, Jay Ryu, Yossi Eliaz, Rangan Mostafa, Nathaniel Musial, Santiago Garcia Acosta, Erica Zhong, Kevin Kim, Ziyi Ye, Stephen Chen, Xingfan Huang, Suhas S.P. Rao, Miriam H. Huntley, Jill P. Mesirov, Eric S. Lander, Erez Lieberman Aiden. The software ecosystem for 3D genomics data analysis and visualization. NSF Site Visit. Center for Theoretical and Biological Physics. Houston, TX. May 2019.

**Muhammad Shamim**, Neva C. Durand, David Weisz, Olga Dudchenko, Erez Lieberman Aiden. Updates to the Juicer and Juicebox ecosystem for Hi-C data analysis and visualization. ENCODE Consortium Meeting. Potomac, MD. January 2019.

Olga Dudchenko, **Muhammad Shamim\***, Sanjit Batra\*, Neva C. Durand, Nathaniel T. Musial, Ragib Mostofa, Melanie Pham, Brian Glenn St Hilaire, Weijie Yao, Elena Stamenova, Marie Hoeger, Sarah K. Nyquist, Valeriya Korchina, Kelcie Pletch, Joseph P. Flanagan, Ania Tomaszewicz, Denise McAloose, Cynthia Pérez Estrada, Ben J. Novak, Arina D. Omer, Erez Lieberman Aiden. The Juicebox Assembly Tools module facilitates de novo assembly of mammalian genomes with chromosome-length scaffolds for under \$1000. BCM Medical Scientist Training Program Student Poster Session. Houston, TX. April 2018.

**Muhammad Shamim\***, Neva C. Durand\*, James T. Robinson\*, Ido Machol, Suhas S. P. Rao, Miriam H. Huntley, Jill P. Mesirov, Eric S. Lander, and Erez Lieberman Aiden. “Contact Mapping by the Billions: Exploring the 3D Architecture of Cancer Genomes with Juicer and Juicebox.” 6th Annual McNair Symposium. Houston, TX. May 2017.

Pakorn Wongwaitayakornkul\* and **Muhammad Shamim\***. “A Non-Invasive Diagnostic Tool for Cardiac Pressure Gradients.” Rice Engineering Design Showcase. Houston, TX. May 2014.

**Muhammad Shamim** and Jennifer Young. “A Comprehensive Mathematical Framework for Modeling Intestinal Smooth Muscle Cell Contraction with Applications to Intestinal Edema.” Rice Centennial Poster Session. Houston, TX. October 2012.

**Muhammad Shamim**, Cory Hauck, and Yulong Xing. “A Discontinuous Galerkin Method for the  $M_1$  Model of Radiative Transfer.” Oak Ridge National Laboratory. Oak Ridge, TN. August 2012.

**Muhammad Shamim** and Jennifer Young. “A Comprehensive Mathematical Framework for Modeling Intestinal Smooth Muscle Cell Contraction with Applications to Intestinal Edema.” Society for Mathematical Biology. Knoxville, TN. July 2012.

### SIGNIFICANT EXPERIENCES

Professional Leadership Coaching, Doerr Institute for New Leaders, Houston, TX	2019
Visiting Researcher, Broad Institute of MIT and Harvard, Cambridge MA	2014 – 2016
Bioinformatics Programmer, The Center for Genome Architecture, Houston, TX	2014 – 2016

DOE SULI Intern, Oak Ridge National Laboratory, Oak Ridge, TN 2012

### **LEADERSHIP, CERTIFICATIONS, AND MEMBERSHIPS**

Treasurer, Pathology Interest Group, Baylor College of Medicine 2023 – Present  
NIH ENCODE Project – Nuclear Architecture Working Group 2019 – 2022  
    Co-Chair, Modeling and Predictions Subgroup 2019 – 2022  
    Co-Chair, Predicting Nuclear Architecture Subgroup 2019  
American Physician Scientists Association 2016 – Present  
    Vice Chair, Partnerships 2023 – Present  
    Chair, Technology, Executive Council 2018 – 2020  
    South Regional Conference Planning Committee 2018  
    Vice Chair, Public Relations 2017 – 2018  
    Institutional Representative (Baylor College of Medicine) 2017 – 2018  
    Member 2016 – Present  
Member, Rice Engineering Alumni Association 2016 – 2018  
Interviewer, Rice Alumni Volunteers for Admission (RAVA) 2015 – 2017  
Rice University Emergency Medical Services 2012 – 2016  
    Reserve Lieutenant 2014 – 2016  
    Lieutenant, InCharge 2012 – 2014  
    BLS Training Center Faculty, UTHSC – American Heart Association 2013 – 2014  
    Member, National Collegiate EMS Foundation 2013 – 2014  
    EMT Delegate, Texas Medical Association First Tuesday Event 2013  
    BLS Instructor, American Heart Association 2012 – 2018  
    BLS Provider (CPR/First Aid), American Heart Association 2012 – 2020  
    EMT-Intermediate, Texas Department of State Health Services 2012 – 2016  
    Advanced EMT, National Registry of EMTs 2012 – 2016  
Co-Founder, Chair, Rice University Muslim Alumni Group 2012 – 2016  
Baker College Society of Academic Mentors 2012 – 2014  
Member, Society for Mathematical Biology 2012 – 2013  
Computer Science Club 2011 – 2014  
Euler Math Club 2011 – 2012  
Muslim Student Association 2010 – 2014

### **TEACHING EXPERIENCE**

Graduate Research Mentor, Fatima Al-Fihri Predoctoral Fellowship 2021 – 2022  
    Remotely mentored 6 research students in Ethiopia, Pakistan, India, and Bangladesh  
Graduate Teaching Assistant, BIOE 332: Thermodynamics 2020  
Graduate Teaching Assistant, BIOE 420: Transport Phenomena 2019  
Graduate Research Mentor, The Center for Genome Architecture 2018 – 2022  
    Primary mentor to 16 undergraduate students from Rice, UT, and UH  
Research Mentor, The Center for Genome Architecture 2015 – 2017  
    Primary mentor to 6 undergraduate students from Rice, UH, and UChicago  
Rice Code College, Rice Engineering Alumni Association 2015 – 2016  
Mentor, OwlEyes VR ENGI Team 2015  
Rice Senior Interviewer 2013 – 2014  
Baker College Academic Mentor, Rice University 2012 – 2014  
Rice University Emergency Medical Services 2012 – 2017  
    Preceptor 2014 – 2016  
    Field Training Officer 2013 – 2014  
    Basic Life Support Instructor 2012 – 2017  
    Education Advisory Committee 2012 – 2014

Grader, CAAM 335: Matrix Analysis 2012  
Teaching Assistant, CAAM 210: Intro to Computational Engineering 2011 – 2014

**GOOGLE PLAY – ANDROID APPS**

**Muhammad Shamim** and Erez Aiden. Reality Hacker VR. 220,000+ Downloads. (2019)  
**Muhammad Shamim**, Ido Machol, and Erez Aiden. Juicebox VR. 1,800+ Downloads. (2019)  
Marie Hoeger, **Muhammad Shamim**, and Erez Aiden. inVRted Series. 1,800+ Downloads. (2019)  
Marie Hoeger, **Muhammad Shamim**, and Erez Aiden. marsroVR Series. 800+ Downloads. (2019)

**ADDITIONAL CLINICAL EXPERIENCES**

Ben Taub Hospital Emergency Department Volunteer 2013 – 2014  
Harris County Emergency Corps (Reserve EMT) 2012 – 2014  
Rice University Emergency Medical Services 2012 – 2016  
Clinical Shifts (Ben Taub Hospital, Texas Children’s Hospital) 2011 – 2012  
Memorial Hermann – Texas Medical Center (Volunteer) 2010 – 2011

**TECHNICAL SKILLS**

Experience programming in JAVA, C++, Python, MATLAB, FORTRAN, Mathematica,  
JavaScript, AWK, and HTML/JS/CSS  
Fluent in Urdu (Hindi) and basic limited proficiency in Arabic and Spanish