Curriculum Vitae

Hrayer Aprahamian

Assistant Professor
Department of Industrial and Systems Engineering, Texas A&M University
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Education

Virginia Tech - Blacksburg, VA, United States   *August 2014 - May 2018*
    Ph.D. in Industrial and Systems Engineering
    Major: Operations Research

    Dissertation: Optimal Risk-based Pooled Testing in Public Health Screening, with Equity and
    Robustness Considerations
    Advisors: Prof. Ebru Bish (co-chair), Prof. Douglas Bish (co-chair)

American University of Beirut - Beirut, Lebanon   *August 2010 - August 2012*
    M.S. in Engineering Management
    Track: Financial Engineering

    Dissertation: Pricing Asian Options via Compound Gamma and Orthogonal Polynomials
    Advisor: Prof. Bacel Maddah

Lebanese University - Beirut, Lebanon   *September 2007 - July 2010*
    B.S. in Physics

    Awarded certificate of excellence from the Dean of Faculty of Sciences
    Ranked first among graduating class

All graduate education has been supported by scholarships and assistantships

Academic Positions

Assistant Professor   *July 2018 - Present*
    Industrial and Systems Engineering, Texas A&M University
Research Assistant   *August 2014 - May 2018*
    Industrial and Systems Engineering, Virginia Tech
Research Associate   *June 2013 - May 2014*
    AUBMC, American University of Beirut
Research Assistant,   *August 2010 - July 2012*
    Industrial and Systems Engineering, American University of Beirut

Research Interests

My research interests lie at the interplay between combinatorial/discrete and global optimization.
My work aims to find new solution techniques and efficient algorithmic approaches to new classes of

optimization problems while considering novel and timely applications. Current projects include the identification of policies and strategies for the optimal surveillance and risk mitigation of emerging infectious diseases (in collaboration with University of Texas Medical Branch), and the use of data analytics and mathematical programming to quantify effectiveness of mental health treatment plans, optimize their performance, and streamline operations (in collaboration with Texas A&M's Counseling & Psychological Services). More recently, I have applied my work to other settings including the construction of new globally-convergent algorithms for accurately calibrating mechanical constitutive models of materials, and the establishment of novel surrogate-based simulation optimization procedures capable of handing complex large-scale stochastic simulations.

Research Methodologies: Discrete/combinatorial optimization; continuous programming; robust/stochastic optimization; network analysis; probability and statistics.

Honors and Awards

IEOM Young Researcher Award   *2023*
    Industrial Engineering and Operations Management Society International

Pierskalla Award   *2022*
    First place for the paper:
    An Optimization Framework for Customized Targeted Mass Screening of Non-uniform Populations under the Availability of Multiple Schemes and Tests.

INFORMS JFIG Paper Competition   *2021*
    Finalist for the paper:
    Optimal Unlabeled Set Partitioning with Application to Risk-based Quarantine Policies

IISE Transactions Award   *2020*
    Awarded for the paper:
    Adaptive Risk-based Pooling in Public Health Screening

Pritsker Doctoral Dissertation Award   *2019*
    First place for the dissertation:
    Optimal Risk-based Pooled Testing in Public Health Screening, with Equity and Robustness Considerations.

Young Distinguished Alumni Award   *2019*
    Department of Industrial Engineering and Management
    American University of Beirut

Pierskalla Award   *2017*
    Runner up for the paper:
    Optimal risk-based group testing strategies.

Paul E. Torgersen Graduate Student Research Excellence Award   *2018*
    First place for the dissertation:
    Optimal Risk-based Pooled Testing in Public Health Screening, with Equity and Robustness Considerations.

Bonder Scholar for Applied Operations Research in Health Services   *2017*
    Finalist for the dissertation:
    Optimal Risk-based Pooled Testing in Public Health Screening, with Equity and Robustness Considerations.

John A. White Graduate Teaching Assistantship   *2017*
    Awarded based on superior academic achievements and credentials

Virginia Tech, Department of Industrial and Systems Engineering

Alexander E. Walter Graduate Fellowship   *2015*
    Awarded based on superior academic achievements and credentials
    Virginia Tech, Department of Industrial and Systems Engineering

John L. Pratt Graduate Fellowship   *2014*
    Awarded based on superior academic achievements and credentials

Publications

1. S. Li*, **H. Aprahamian**, M. Nouiehed, H. El-Amine. An Optimization-based Order-and-cut Approach for Fair Clustering of Datasets. *To appear in INFORMS Journal on Data Science.*

2. J. Barth, S. Li*, **H. Aprahamian**, D. Gupta. Spatiotemporal Vaccine Allocation Policies for Epidemics with Behavioral Feedback Dynamics. *To appear in Naval Research Logistics.*

3. S. Chatterjee*, Y. Hebaish*, J. Deegear, M. Rucker, L. Ntaimo, and **H. Aprahamian**. A Data-driven Simulation Approach to Quantify the Effect of Group Counseling on System Performance of College Counseling Centers. *To appear in Journal of American College Health.*

4. J. Lin*, **H. Aprahamian**, and G. Golovko. Optimal Targeted Mass Screening in Non-uniform Populations with Multiple Tests and Schemes. *To appear in Naval Research Logistics.*

5. S. Li* and **H. Aprahamian**. Quantifying the Benefits of Customized Vaccination Strategies: A Network-based Optimization Approach. *Naval Research Logistics*, 2023.

6. H. Chawla, S. Yadav, **H. Aprahamian**, D. Sagapuram. Determining Large-strain Metal Plasticity Parameters using in situ Measurements of Plastic Flow Past a Wedge. *Proceedings of Royal Society*, 2023.

7. J. Lin*, **H. Aprahamian**, H. El-Amine. Optimal Unlabeled Set Partitioning with Application to Risk-based Quarantine Policies. *IISE Transactions*, 2023.

8. S. Li* and **H. Aprahamian**. An Optimization-based Social Separation Framework to Minimize the Spread of Diseases in Social Networks with Heterogeneous Nodes. *IISE Transactions*, 2023.

9. S. Chatterjee*, Y. Hebaish*, L. Ntaimo, J. Deegear, M. Rucker, **H. Aprahamian**. A Quantitative Simulation-based Modeling Approach for College Counseling Centers. *Simulation*, 2023.

10. **H. Aprahamian**, S. Butenko, Z. Hunt, M. Makovenko, C. Martin, M. Paradalos, S. Talcott. Can Fast Food Eating Patterns be Healthy? An Optimization-based Analysis of Popular U.S. Fast Food Chains. *Operations Research Forum*, 2023.

11. **H. Aprahamian**, H. El-Amine. Set Partitioning: Applications in Healthcare. *Encyclopedia of Optimization*, 2022.

12. **H. Aprahamian**, H. El-Amine. Optimal Clustering of Frequency Data with Application to Disease Risk Categorization. *IISE Transactions*, 2022.

13. H. El-Amine, **H. Aprahamian**. A Heuristic Scheme for Multivariate Set Partitioning Problems with Application to Classifying Heterogeneous Populations for Multiple Binary Attributes. *IISE Transactions*, 2022.

14. H. El Hajj, D. R. Bish, E. K. Bish, **H. Aprahamian**. Screening Multi-dimensional Heterogeneous Populations for Infectious Diseases under Scarce Testing Resources, with Application to COVID-19. *Naval Research Logistics*, 69(1):3-20, 2022.

15. **H. Aprahamian**, H. El-Amine. Optimal Screening of Populations with Heterogeneous Risk Profiles Under the Availability of Multiple Tests. *INFORMS Journal on Computing*, 2021.

16. D. R. Bish, E. K. Bish, H. El Hajj, **H. Aprahamian**. A Robust Pooled Testing Approach to Expand COVID-19 Screening Capacity. *PLoS One*, 16(2), 2021.

17. **H. Aprahamian**, E. K. Bish, D. R. Bish. Static Risk-based Group Testing Schemes under Imperfectly Observable Risk. *Stochastic Systems*, 10(4):361-390, 2020.

18. **H. Aprahamian**, D. R. Bish, E. K. Bish. Optimal Group Testing: Structural Properties and Robust Solutions, with Application to Public Health Screening. *INFORMS Journal on Computing*, 32(4):895-911, 2020.

19. N. Nguyen, **H. Aprahamian**, E. K. Bish, D. R. Bish. A Methodology for Deriving the Sensitivity of Pooled HIV Testing, Based on Viral Load Progression and Pooling Dilution. *Journal of Translational Medicine*, 17(1):1-10, 2019.

20. **H. Aprahamian**, D. R. Bish, E. K. Bish. Optimal risk-based group testing. *Management Science*, 65(9):4365-4384, 2019.

21. **H. Aprahamian**, E. K. Bish, D. R. Bish. Adaptive risk-based array pooling in public health screening. *IISE Transactions*, 50(9):753-766, 2018.

22. N. Nguyen, E. K. Bish, **H. Aprahamian**. Sequential prevalence estimation with pooling and continuous test outcomes under limited resources. *Statistics in Medicine*, 37(15):2391-2426, 2018.

23. **H. Aprahamian**, D. R. Bish, E. K. Bish. Residual risk and waste in donated blood with pooled nucleic acid testing. *Statistics in Medicine*, 35(28):5283-5301, 2016.

24. **H. Aprahamian**, B. Maddah. Pricing Asian options via compound gamma and orthogonal polynomials. *Applied Mathematics and Computation*, 264:21-43, 2015.

Submitted for Publication

1. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. An Optimal Path Discovery Procedure for Regret-based Multi-period Problems with Applications to Infectious Disease Screening. *Under second round of review with INFORMS Journal on Computing.*

2. S. Chatterjee* and **H. Aprahamian**. Capturing the Dilution Effect of Risk-based Testing with Application to COVID-19. *Under second round of review with Naval Research Logistics.*

3. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. The Impact of Early Large-scale Screening on the Evolution of Pandemics. *Under second round of review with IISE Transactions.*

4. S. Li*, **H. Aprahamian**, and S. Chatterjee*. An Efficient Epsilon-optimal Convex Relaxation-Based Spatial Branching Scheme with Application to Robust Large-scale Screening. *Under review with INFORMS Journal on Computing.*

5. Y. Hebaish*, S. Chatterjee*, **H. Aprahamian**, J. Deegear, M. Rucker, and L. Ntaimo. Optimizing Scheduling in Multi-service Systems with Policy-design Constraints: Application to University Mental Health Services. *Under review with Stochastic Systems.*

6. S. Chatterjee*, Y. Hebaish*, **H. Aprahamian**, J. Deegear, M. Rucker, and L. Ntaimo. An Optimization-based Scheduling Methodology for Multi-service Appointment Systems with Non-stationary Arrival Processes. *Under review with INFORMS Journal of Computing.*

7. S. Chatterjee*, Y. Hebaish*, **H. Aprahamian**, J. Deegear, M. Rucker, and L. Ntaimo. Learning from Unfolding Dynamics: Forecast-Driven Adaptive Scheduling in Multi-Service Non-stationary Queues. *Under review with Operations Research.*

8. S. Chatterjee*, Y. Hebaish*, **H. Aprahamian**, J. Deegear, M. Rucker, and L. Ntaimo. A Gaussian Process Regression Scheme for Ragged Data Structures with Application to Predicting Treatment Outcomes. *Under first round of review with Journal of Operations Management.*

9. H. Chawla*, **H. Aprahamian**, and D. Sagapuram. A General Global Optimization Framework for Estimating Material Constitutive Parameters. *Under review with SIAM Journal on Applied Mathematics.*

10. J. Lin*, **H. Aprahamian**, and G. Golovko. Optimal Targeted Mass Screening Under Limited Testing Capacity with Application to COVID-19. *Under review with IISE Transactions.*

11. J. Lin*, **H. Aprahamian**, and G. Golovko. A Proactive/Reactive Mass Screening Approach with Uncertain Symptomatic Cases. *Under review with Healthcare Management Science.*

Working Papers

1. Y. Hebaish*, S. Chatterjee*, **H. Aprahamian**, R. Tuo, and L. Ntaimo. Bayesian Optimization for Enhanced Student Responses to Mental Health Treatments. *To be submitted to Artificial Intelligence in Medicine.*

2. Y. M. Valizadeh, R. Tuo, S. Chatterjee*, and **H. Aprahamian**. Estimating Large-Scale Simulations with Bayesian Neural Networks: An Application to Optimize the Operations of College Counseling Centers. *To be submitted to Neural Networks.*

3. S. Chatterjee*, **H. Aprahamian**, and H. El-Amine. The Probabilistic Set Partitioning Problem: A Heuristic Approach with Guaranteed Optimality Bounds. *To be submitted to SIAM Journal on Optimization.*

4. J. Lin*, S. Li*, H. Aprahamian, and **G. Golovko**. A Multi-period Mass Screening Framework for the Optimal Control of Infectious Disease Outbreaks. *To be submitted to INFORMS Journal on Computing.*

5. S. Li*, J. Lin*, and **H. Aprahamian**. An Integrated Strategy for Controlling Infectious Disease Outbreaks: Social Distancing, Mass Screening, and Vaccine Distribution. *To be submitted to IISE Transactions.*

6. S. Chatterjee*, **H. Aprahamian**, A. Banerjee, and P. Sharifi. A Network-based Collaboration Model for Sustainability of Rural Hospitals. *To be submitted to Networks.*

7. S. Chatterjee*, **H. Aprahamian**, A. Banerjee, and P. Sharifi. Can Collaborations Help Save Rural Hospitals? A Quantitative Analysis. *To be submitted to Journal of the American Medical Informatics Association.*

8. T. Shehadi, **H. Aprahamian**, and M. Nouiehed. Preserving the Voice of Minorities: A Novel Fairness Metric for Unsupervised Machine Learning. *To be submitted to Journal of Artificial Intelligence Research.*

Invited Conference Oral Presentations

1. S. Chatterjee*, Y. Hebaish, **H. Aprahamian**, and L. Ntaimo. An Optimization-based Scheduling Framework for Multi-service Appointment Systems with Non-stationary Arrival Processes. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

2. Y. Hebaish, S. Chatterjee*, **H. Aprahamian**, and L. Ntaimo. A Machine Learning-aided Stochastic Programming Model for Scheduling College Counseling Appointments. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

3. J. Lin and **H. Aprahamian**. An Optimization Framework for Customized Targeted Mass Screening of Non-uniform Populations under the Availability of Multiple Schemes and Tests. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

4. J. Lin*, **H. Aprahamian**, and H. El-Amine. A Two-stage Stochastic Formulation for Proactive and Reactive Mass Screening with Uncertain Symptomatic Cases. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

5. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. An Optimal Path Discovery Procedure for Regret-based Multi-period Problems with Applications to Infectious Disease Screening. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

6. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. The Impact of Early Large-scale Screening on the Evolution of Pandemics. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

7. S. Li* and **H. Aprahamian**. Quantifying the Benefits of Customized Vaccination Strategies: A Network-based Optimization Approach. *INFORMS Annual Meeting*, Indianapolis, IN, October 2022.

8. S. Chatterjee* and **H. Aprahamian**. Capturing the Dilution Effect of Risk-based Group Testing with Application to COVID-19 Screening. *INFORMS Annual Meeting*, Anaheim, CA, October 2021.

9. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. The Impact of Early Large-scale Screening on the Evolution of Pandemics. *INFORMS Annual Meeting*, Anaheim, CA, October 2021.

10. J. Lin* and **H. Aprahamian**. Targeted Mass Screening of Heterogeneous Populations with Application to COVID-19 Screening. *INFORMS Annual Meeting*, Anaheim, CA, October 2021.

11. J. Lin*, **H. Aprahamian**, and H. El-Amine. Optimal Unlabeled Set Partitioning with Application to Risk-based Quarantine Policies. *INFORMS Annual Meeting*, Anaheim, CA, October 2021.

12. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. The Impact of Early Large-scale Screening on the Evolution of Pandemics. *INFORMS Healthcare Conference*, Virtual, July 2021.

13. S. Chatterjee*, **H. Aprahamian**, A. Banerjee, and P. Sharifi. A Collaboration Model to Improve Healthcare Access in Rural Communities. *INFORMS Healthcare Conference*, Virtual, July 2021.

14. J. Lin*, **H. Aprahamian**, and H. El-Amine. Optimal Unlabeled Set Partitioning with Application to Risk-based Quarantine Policies. *INFORMS Healthcare Conference*, Virtual, July 2021.

15. H. El Hajj, D. R. Bish, E. K. Bish, and **H. Aprahamian**. Screening Multi-dimensional Heterogeneous Populations for Infectious Diseases Under Scarce Testing Resources, with Application to COVID-19. *INFORMS Healthcare Conference*, Virtual, July 2021.

16. S. Chatterjee* and **H. Aprahamian**. Capturing the Dilution Effect of Risk-based Group Testing with Application to COVID-19. *INFORMS Healthcare Conference*, Virtual, July 2021.

17. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. An Optimization-based Framework for Problems with Time-dependent Uncertainty, with Application to Infectious Disease Screening. *INFORMS Healthcare Conference*, Virtual, July 2021.

18. S. Chatterjee* and **H. Aprahamian**. Capturing the Dilution Effect of Risk-based Group Testing with Application to COVID-19. *INFORMS Annual Meeting*, Virtual, October 2020.

19. J. Lin*, **H. Aprahamian**, and H. El-Amine. Optimal Unlabeled Set Partitioning with Application to Risk-based Quarantine Policies. *INFORMS Annual Meeting*, Virtual, October 2020.

20. D. R. Bish, E. K. Bish, H. El Hajj, and **H. Aprahamian**. Mass Testing Of Infectious Diseases With Pooling, With Application To Covid-19 Testing. *INFORMS Annual Meeting*, Virtual, October 2020.

21. M. Shams Eddin*, H. El-Amine, and **H. Aprahamian**. Robust Decision-making Under Operational Constraints, With Applications To Large-scale Population Screening . *INFORMS Annual Meeting*, Virtual, October 2020.

22. **H. Aprahamian**, E. K. Bish, and D. R. Bish. Adaptive risk-based array pooling in public health screening. *IISE Annual Conference and Expo*, Virtual, October 2020.

23. **H. Aprahamian** and H. El-amine. Optimal Clustering of Frequency Data with Application to Disease Risk Categorization. *INFORMS Annual Meeting*, Seattle, WA, November 2019.

24. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Optimal Test Selection for the Screening of Heterogeneous Populations. *INFORMS Healthcare Conference*, Boston, MA, July 2019.

25. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Optimal Group Testing: Structural Properties and Robust Solutions, with Application to Public Health Screening. *INFORMS Healthcare Conference*, Boston, MA, July 2019.

26. **H. Aprahamian**. Advancing Healthcare with Operations Research. *IDEAS Conference*, Beirut, Lebanon, April 2019.

27. **H. Aprahamian**, D. R. Bish, and E. K. Bish. The Two-stage Group Testing Problem: The Exact Analytical Solution with an Application to Robust Group Testing. *INFORMS Annual Meeting*, Phoenix, AZ, November 2018.

28. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Optimal risk-based group testing. *INFORMS Annual Meeting*, Houston, TX, October 2017.

29. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Optimal static risk-based group testing under imperfectly observable risk. *INFORMS Annual Meeting*, Houston, TX, October 2017.

30. **H. Aprahamian**, E. K. Bish, and D. R. Bish. Adaptive risk-based array pooling in public health screening. *INFORMS Annual Meeting*, Houston, TX, October 2017.

31. **H. Aprahamian**, E. K. Bish, and D. R. Bish. Adaptive risk-based array pooling in public health screening. *INFORMS Annual Meeting*, Nashville, TN, November 2016.

32. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Residual risk and waste in donated blood with pooled nucleic acid testing. *INFORMS Annual Meeting*, Philadelphia, PA, November 2015.

33. **H. Aprahamian**, D. R. Bish, and E. K. Bish. Modeling of residual risk and waste in donated blood with pooled nucleic acid testing and under the dilution effect. *INFORMS Healthcare Conference*, Nashville, TN, July 2015.

Conference Activities

INFORMS 2023 Organizing Committee *June, 2022 - Present*
    Role: Poster sessions chair
    Conference: INFORMS Annual Meeting

Health Applications Society (HAS) Award Committee *October, 2022 - Present*
    Role: Pierskalla award chair
    Conference: INFORMS Annual Meeting

Breaking the Chain: Using OR to Control Infectious Outbreaks *October, 2023*
    Role: Session chair
    Conference: INFORMS Annual Meeting

Unleashing the Power of Data in Healthcare *July, 2023*
    Role: Session chair
    Conference: INFORMS Healthcare Conference

Driving Progress in Public Health with Operations Research *July, 2023*
    Role: Session chair
    Conference: INFORMS Healthcare Conference

Operations Research in Public Health: Recent Advances and Trends *Fall 2022*
    Role: Session chair
    Conference: INFORMS Annual Meeting

Optimization under Uncertainty: Applications in Healthcare *Fall 2022*
    Role: Session chair
    Conference: INFORMS Annual Meeting

JFIG Panel Discussion: Publications and Review Process *Fall 2021*
    Role: Session chair
    Conference: INFORMS Annual Meeting

Data-driven Approaches for Combating Healthcare Challenges *Fall 2021*
    Role: Session Chair
    Conference: INFORMS Annual Meeting

INFORMS 2021 Poster Competition *Fall 2021*
    Role: Reviewer
    Conference: INFORMS Annual Meeting

Data-driven Approaches for Combating Healthcare Challenges *Spring 2021*
    Role: Session Chair
    Conference: INFORMS Healthcare Conference

Prevailing Issues in Public Sector OR *Fall 2018*
    Role: Session Chair
    Conference: INFORMS Annual Meeting

Invited Talks

Health Applications Society Seminar Series *1/27/2023*
    Institute for Operations Research and the Management Sciences

American University of Beirut *12/27/2022*
    Suliman S. Olayan School of Business

Xi'an Jiaotong University *11/25/2022*
    Department of Industrial Engineering & Operations Management

University of Alabama *11/11/2022*

Culverhouse College of Business
Northwestern University *9/12/2022*
Center for Engineering and Health
Universidad Adolfo Ibañez *11/18/2020*
School of Business Operations Group
American University of Beirut *10/23/2020*
Department of Industrial Engineering and Management
University of Houston *10/16/2020*
Department of Industrial Engineering

Journal Editorial Board

Information Systems and Operational Research *2021-present*
Associate Editor of the area: *Operations Research in Health Care*

Journal Peer Reviewer

1. Management Science
2. Proceedings of the National Academy of Sciences of the United States of America
3. INFORMS Journal on Computing
4. European Journal of Operational Research
5. IISE Transactions on Healthcare Systems Engineering
6. IISE Transactions
7. Naval Research Logistics
8. PLoS Computational Biology
9. PLoS One
10. Omega
11. Biometrics
12. Service Science
13. Statistics in Medicine
14. Healthcare Management Science
15. Information Systems and Operational Research
16. Operational Research
17. International Journal of Industrial Engineering Theory, Applications and Practice

Funded and Submitted Research Projects

Predicting the Impact of New Interventions on Mental Health: A Collaborative Approach with Psychiatrists for University Students *2023*
Role: PI
Sponsor/Status: National Institutes of Health/Planned
Award amount (amount attributable to faculty member): $162,448 ($81,224)

Advancing Predictive Capabilities: Layered Kernel Surface Modeling through Bayesian Neural Networks *2023*
Role: PI
Sponsor/Status: National Science Foundation/Planned
Award amount (amount attributable to faculty member): $366,333 ($183,166)

Turning the Tide: Novel Data Analytics and Optimization Approaches for Mitigating the University Mental Health Crisis *2023*

Role: PI
Sponsor/Status: National Science Foundation/Submitted
Award amount (amount attributable to faculty member): $559,689 ($559,689)

Learning by Seeing: A High-Throughput Framework for Characterizing Material Strength under Extremes   *2023*
Role: co-PI
Sponsor/Status: National Science Foundation/Submitted
Award amount (amount attributable to faculty member): $1,711,312 ($ 855,656)

Optimizing Infectious Outbreak Response with Data-Driven Spatiotemporal Mass Screening   *2023*
Role: PI
Sponsor/Status: National Science Foundation/Submitted
Award amount (amount attributable to faculty member): $401,729 ($341,186)

Advancing Global Optimization through Multi-Tree Partitioning: A Novel Approach for Efficient Global Optimization   *2023-present*
Role: PI
Sponsor/Status: Department of Energy/Funded
Award amount (amount attributable to faculty member): $530,524 ($ 265,262)

Using Collaboration To Preserve Right-Sized Access   *2019-present*
Role: co-PI
Sponsor/Status: Blue Cross Blue Shield of Texas/Funded
Award amount (amount attributable to faculty member): $1,526,573 ($ 247,500)

Designing Optimal Diets Via Mathematical Programming   *2019-2021*
Sponsor/Status: Texas A&M University/Funded
Award amount: $30,000

Reducing Emission by Using Automated Vehicles In Large Urban Areas   *2021-present*
Sponsor/Status: Texas A&M University/Funded
Award amount: $30,000

Teaching Experience

Course Instructor
    Texas A&M, Department of Industrial and Systems Engineering
–ISEN 689 - Combinatorial Optimization (Spring 2021)
- General theory and approaches for solving combinatorial optimization problems. Specific topics include minimum spanning trees, shortest paths, network flow problems, and optimal matchings. The course goes over fundamental concepts of polyhedral theory, matroids, and complexity theory.

–ISEN 623 - Nonlinear Programming (Spring: 2019, 2020, and 2022)
- Theory and numerical methods of nonlinear programming. Topics covered in the course include optimality conditions (Lagrange and Karush-Kuhn-Tucker (KKT) conditions), algorithms for unconstrained and constrained optimization.

–ISEN 320 - Operations Research I (Fall: 2018-2022)
- The course covers the fundamentals of linear programming , including formulation; simplex method; big-M and two-Phase simplex methods; duality and sensitivity analysis; trans-

portation, transshipment, and assignment problems; network models; and optimization software packages (Excel Solver and AMPL).

Virginia Tech, Department of Industrial and Systems Engineering
–ISE 3424 - Deterministic Operations Research II (Summer 2016)
- The course covers fundamentals of operations research model development and analysis, including complexity theory, integer programming (modeling and solution techniques), column generation and decomposition schemes, nonlinear programming, and an introduction to deterministic dynamic programming.

Teaching Assistant

Virginia Tech, Department of Industrial and Systems Engineering
American University of Beirut, Engineering Management Program

Courses (G denotes a graduate level course):

ISE 5406 (G) – Optimization I
ISE 5984 (G) – Supply Chain and Operations Engineering
ISE 5034 (G) – Math Probability and Statistics for ISE's
ISE 4424 – Logistics Engineering
ISE 3424 – Discrete-Event Simulation
ISE 2404 – Deterministic Operations Research I
ISE 2214 – Manufacturing Processes Lab
INDE 301 – Engineering Economy
ENMG 500 – Engineering Management I
ENMG 501– Engineering Management II

Professional Organizations

Institute for Operations Research and Management Sciences (INFORMS)

Health Applications Society, member	
Optimization Society, member	
Manufacturing and Service Operations Management Society, member	
Texas A&M INFORMS Student Chapter, Faculty Advisor,	*2021- Present*
Virginia Tech INFORMS Student Chapter, Vice President	*2016- 2017*
Virginia Tech INFORMS Student Chapter, Chief Financial Officer	*2016- 2017*

Institute of Industrial and Systems Engineers (IISE)

Industrial Experience

Financial Test Analyst *August 2012 - July 2014*

Murex Software S.A.S, Beirut Lebanon

- Worked with the Interest Rate Derivatives (IRD) module so as to ensure high quality control standards for major IRD developments including, verification and validation testing, devising of testing strategies, implementation and monitoring.

- Provided consulting on issues requiring IRD expertise, and was assigned the role of "Test Lead" for a multi-million dollar project; which involved designing, implementing, and managing a testing scheme (automated and manual). This played a crucial role in a smooth and successful software rollout to the client.

Computer Skills

Programming Languages
   C++, VBA, SQL, Matlab, Python.

Optimization and Simulation Packages
   LINGO, AMPL, Excel Solver, Arena, Simio.

Other Software Packages
   MathCAD, Expert Fit, LaTeX, and standard office packages: Microsoft Office.