IAKOVOS TOUMAZIS

Contact Info

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CURRENT POSITION

Assistant Professor
Department of Health Services Research
Division of Cancer Prevention & Population Sciences
The University of Texas MD Anderson Cancer Center

PAST POSITIONS

Postdoctoral Research Fellow
Plevritis' Lab   08/2020
Departments of Biomedical Data Science and Radiology
Stanford University

EDUCATION

Doctor of Philosophy, PhD, Industrial Engineering   09/2015
University at Buffalo, SUNY, Buffalo, NY
Dissertation Title: "Dynamic programming approaches to the palliative chemotherapy scheduling for metastatic colorectal cancer patients"
Co-Advisors: Drs. Murat Kurt and Changhyun Kwon
Committee Members: Drs. Rachael Hageman Blair and Mark Karwan

Master of Science, MS, Industrial Engineering   09/2012
University at Buffalo, SUNY, Buffalo, NY
Thesis Title: "Time-Dependent Conditional Value-at-Risk Minimization Algorithm for Hazardous Materials Routing"

Bachelor of Science, BS, Mathematics   02/2009
University of Patras, Greece

RESEARCH INTERESTS

Application: health care; cancer treatment; cancer screening; cancer surveillance; health economics; medical decision making; decision aid tools; cancer risk assessment
Methodology: Markov decision process; microsimulation; stochastic optimization; linear and nonlinear programming; network optimization; robust optimization; Markov models

PUBLICATIONS

Scientific Articles

1. Han S.S., Chow E., ten Haaf K., **Toumazis I.**, Cao P., Bastani M., Tammemägi M.C., Jeon J., Feuer E.J., Meza R., Plevritis S.K., "Disparities of national lung cancer screening guidelines in the U.S. population," JNCI, 2020, djaa013

2. Criss S.D, Cao P., Bastani M., ten Haaf K., Chen Y., Sheehan D.F., Blom E.F., **Toumazis I.**, Jeon J., de Koning H.J., Plevritis S.K., Meza R., Kong C.Y., "Cost-effectiveness analysis of lung cancer screening in the United States: A comparative modeling study by the CISNET Lung Cancer Group," Ann Intern Med 2019; 171 (11), 796-804

3. ten Haaf K., Bastani M., Jeon J., Cao P., **Toumazis I.**, Han S.S., Plevritis S.K., Blom E.F., Kong C.Y., Tammemägi M.C., Feuer E.J., Meza R., de Koning H.J., "A comparative modeling analysis of risk-based lung cancer screening policies," JNCI 2020, 112 (5), 466-479

4. **Toumazis I.**, Tsai E., Erdogan S.A., Han S., Wan W., Leung A., Plevritis S.K., "Cost-Effectiveness Analysis of Lung Cancer Screening Accounting for the Effect of Indeterminate Findings," JNCI Cancer Spectrum, 2019, 3 (3), pkz035

5. Tammemägi M.C., ten Haaf K., **Toumazis I.**, Kong C.Y., Han S.S., Jeon J., Commins J., Riley T., Meza R., "Development and validation of a multivariable lung cancer risk prediction model that includes low-dose computed tomography screening results: A secondary analysis of data from the National Lung Screening Trial," JAMA Network Open, 2019, 2 (3):e190204

6. **Toumazis I.**, Kurt M., Toumazi A., Karacosta L.G. and Kwon C., "Comparative Effectiveness of Up-to-Three Lines of Chemotherapy Treatment Plans for Metastatic Colorectal Cancer," MDM Policy & Practice, 2017, 2 (2), 1–19

7. Han S.S., Erdogan S.A., **Toumazis I.**, Leung A., and Plevritis S.K., "Evaluating the Impact of Varied Compliance to Lung Cancer Screening Recommendations Using a Microsimulation Model," Cancer Causes & Control, 2017, 28 (9), 947–958

8. **Toumazis I.**, and Kwon C., "Worst-Case Conditional Value-at-Risk Minimization for Hazardous Materials Transportation," Transportation Science, 2016, 50 (4), 1139–1393

9. **Toumazis I.**, and Kwon C., "Routing Hazardous Materials on Time-Dependent Networks using Conditional Value-at-Risk," Transportation Research Part C: Emerging Technologies, 2013, 37, 73-92

Review Articles

1. **Toumazis I.**, Bastani M., Han S.S., and Plevritis S.K., "Risk-Based Lung Cancer Screening: A Systematic Review," Lung Cancer, 2020, Volume 147, pp. 154-186

Book Chapters

1. **Toumazis I.**, Kwon C., and Batta R. (2013), "Value-at-risk and Conditional Value-at-Risk Minimization for Hazardous Materials Routing," in Handbook of OR/MS Models in Hazardous Materials Transportation (Eds.:R. Batta and C. Kwon), Springer, NY

Technical Reports

1. Meza R., Jeon J., **Toumazis I.**, ten Haaf K., Cao P., Bastani M., Han S.S., Blom E.F., Jonas D., Feuer E.J., Plevritis S.K., de Koning H.J., Kong C.Y. (2020) "Evaluation of the Benefits and Harms of Lung Cancer Screening With Low-Dose Computed Tomography: A Collaborative Modeling Study for the U.S. Preventive Services Task Force," Agency for Healthcare Research and Quality (AHRQ), AHRQ Publication No. 20-05266-EF-2, Available at https://www.uspreventiveservicestaskforce.org/uspstf/document/draft-decision-analysis/lung-cancer-screening-2020

Articles under Review
1. **Toumazis I.**, Alagoz O., Leung A., Plevritis S.K., "A Dynamic Risk-Based Lung Cancer Screening Framework Incorporating Life-Expectancy and Past Screening Findings," *Under review*
2. **Toumazis I.**, Erdogan S.A., Bastani M., Leung A., and Plevritis S.K., "A Cost-Effectiveness Analysis of Lung Cancer Screening with CT and a Diagnostic Biomarker," *Under review*

Peer Reviewed Published Abstracts:
1. **Toumazis I.**, Alagoz O., Leung A., Plevritis S.K., "Individualized Risk-Based Lung Cancer Screening Incorporating Past Screening Findings and Changes in Smoking Behaviors," IASLC 2019 World Conference on Lung Cancer, Barcelona, Spain
2. Han S.S., Chow E., ten Haaf K., **Toumazis I.**, Bastani M., Tammemägi M.C., Jeon J., Feuer E., Meza R., Plevritis S.K., "Disparities and National Lung Cancer Screening Guidelines in the US Population," IASLC 2019 World Conference on Lung Cancer, Barcelona, Spain
3. **Toumazis I.**, Kurt M., Karacosta L.G., Toumazi A., Kwon C., Goldstein D.A., "Assessing the role of sequencing up to three lines of chemotherapy in metastatic colorectal cancer treatment: A cost-effectiveness analysis," The 37th Annual Meeting of the Society of Medical Decision Making, St. Louis, MO
4. **Toumazis I.**, Kurt M., Karacosta L.G., Toumazi A., Kwon C., Goldstein D.A., "A dynamic programming approach to palliative chemotherapy scheduling for metastatic colorectal cancer patients," 2015 MSOM Healthcare Special Interest Group Meeting, Toronto, ON
5. **Toumazis I.**, Kurt M., Ozaltin O., Denton B.T., and Shah N.D., "Eliciting cholesterol management guidelines' valuation of future life," The 36th Annual Meeting of the Society for Medical Decision Making, Miami, FL

INVITED RESEARCH SEMINARS
- **Toumazis I.**, "A New Paradigm in Lung Cancer Screening: Screening for Individuals not Populations," Roswell Park Comprehensive Cancer Center, Buffalo, NY
- **Toumazis I.**, "The Future of Lung Cancer Screening: Is Personalized Screening Necessary and Feasible?," Division of Cancer Control & Population Sciences, National Cancer Institute (NCI), Rockville, MD
- **Toumazis I.**, "Personalized Lung Cancer Screening: The Individualized Lung Screening Scheduler (ILungSS)," 2019 CISNET Mid-Year Meeting, Junior Investigators Meeting, Seattle, WA
- **Toumazis I.**, "Lung Cancer Screening: Is Individualized Screening a Feasible Solution to Existing Problems?," The University of Texas MD Anderson Cancer Center, Houston, TX
- **Toumazis I.**, "Personalizing Lung Cancer Screening Using a Partially Observable Markov Decision Process," 2018 Stanford Intelligent Systems Lab Meeting, Stanford, CA

CONFERENCE PRESENTATIONS
Oral Presentations:
- **Toumazis I.**, Alagoz O., Leung A., Plevritis S.K., "Personalized lung cancer screening strategies using a partially observable Markov decision process," 2019 INFORMS Healthcare Meeting, Cambridge, MA

- Bastani M., **Toumazis I.**, Leung A., Plevritis S.K., "Evaluation of Alternative Subsequent Screening for LungRADS Criteria on the Effectiveness of Lung Cancer Screening," 2019 INFORMS Healthcare, Cambridge, MA
- **Toumazis I.**, Alagoz O., Leung A., Plevritis S.K., " Personalized lung cancer screening strategies using a partially observable Markov decision process," 2018 INFORMS Annual Meeting, Phoenix, AZ
- **Toumazis I.**, Tsai E.B., Erdogan A., Han S., Leung A., Plevritis S.K., "The effect of indeterminate findings on the cost-effectiveness of lung cancer screening," 2018 INFORMS Annual Meeting, Phoenix, AZ
- Bastani M., Plevritis S.K., **Toumazis I.**, Leung A., "Evaluation of alternative diagnostic test intervals and thresholds for Lung-RADS criteria on the effectiveness of lung cancer screening," 2018 INFORMS Annual Meeting, Phoenix, AZ
- **Toumazis I.**, Tsai E., Erdogan A., Han S., Wan W., Leung A., Plevritis S.K., "Impact Of False-Positives On The Cost-effectiveness of Lung Cancer Screening,"
    - 2017 INFORMS Healthcare Conference, Rotterdam, Netherlands
    - 2016 INFORMS Annual Meeting, Houston, TX
- **Toumazis I.**, Erdogan A., Plevritis S.K., "Evaluating the impact of diagnostic biomarkers on the cost-effective efficiency frontier of alternative lung cancer screening strategies," 2016 INFORMS International Conference, Hawaii, HA
- **Toumazis I.**, Kurt M., Karacosta L.G., Toumazi A., Kwon C., Goldstein D.A., "A dynamic programming approach to palliative chemotherapy scheduling for metastatic colorectal cancer patients,"
    - 2016 INFORMS International Conference, Hawaii, HA
    - 2015 INFORMS Annual Meeting, Philadelphia, PA
    - 2015 MSOM Healthcare Special Interest Group Meeting, Toronto, ON
    - 2015 IIE Annual Conference, Nashville, TN
    - 2015 Healthcare Systems Process Improvement Conference, Orlando, FL
- **Toumazis I.**, Denton B., Kurt M., Osman, O. Shah N., "Eliciting cholesterol management guidelines' valuation of future life,"
    - 2014 INFORMS Annual Meeting, San Francisco, CA
    - The 36th Annual Meeting of the Society for Medical Decision Making, Miami, FL
- **Toumazis I.**, Kwon C., "Advanced risk measures applied in hazardous materials routing," 2013 INFORMS Annual Meeting, Minneapolis, MN
- **Toumazis I.**, Kwon C., "Conditional value-at-risk for hazardous materials transportation on time-dependent networks,"
    - 2012 INFORMS Annual Meeting, Phoenix, AZ
    - 2012 CORS-SCRO, Niagara Falls, ON, Canada
    - 2012 IIE Annual Conference, Orlando, FL
- Kwon C., **Toumazis I.**, Lee T., "Worst case conditional value-at-risk minimization in hazardous materials transportation," 2011 INFORMS Annual Meeting, Charlotte, NC

Poster Presentations:
- **Toumazis I.**, Alagoz O., Leung A., Plevritis S.K., "Individualized Risk-Based Lung Cancer Screening Incorporating Past Screening Findings and Changes in Smoking Behaviors," 2019 World Conference on Lung Cancer, Barcelona, Spain

- Han S.S., Chow E., ten Haaf K., **Toumazis I.**, Bastani M., Tammemägi M.C., Jeon J., Feuer E., Meza R., Plevritis S.K., "Disparities and National Lung Cancer Screening Guidelines in the U.S. Population," 2019 World Conference on Lung Cancer, Barcelona, Spain
- **Toumazis I.**, Kurt M., Karacosta L.G., Toumazi A., Kwon C., Goldstein D.A., "Assessing the role of sequencing up to three lines of chemotherapy in metastatic colorectal cancer treatment: A cost-effectiveness analysis," The 37th Annual Meeting of the Society of Medical Decision Making, St. Louis, MO

RESEARCH SUPPORT

Ongoing:
- Meza R., "Comparative Modeling of Lung Cancer Prevention, Early Detection and Treatment Interventions."

  Role: Co-Investigator (co-I)

  Duration: September 1, 2020 - August 31, 2025

  Description: This proposed work will extend existing Cancer Intervention and Surveillance Modeling Network (CISNET) Lung Working Group models to assess the impacts of future tobacco control interventions, improvements in lung cancer screening, innovations in lung cancer treatment, and their synergistic interactions, on lung cancer rates and overall mortality in the US and globally.

Past:
- U01CA199284 (Meza, De Koning, Kong, Plevritis, Holford, Levi, Multi-PIs), National Institutes of Health/National Cancer Institute, "Comparative Modeling of Lung Cancer Prevention and Control Policies"

  Role: Postdoctoral Fellow

  Duration: September 1, 2015 - August 31, 2020

  Description: Use comparative modeling to investigate promising policies targeting both primary prevention and screening while considering the interactions between smoking behaviors and screening. The Cancer Intervention and Surveillance Modeling Network (CISNET) lung group develops and applies population models for lung cancer, quantifying the impact of tobacco control and CT screening on lung cancer and all-cause mortality. This proposed work will extend existing CISNET lung models to investigate the synergistic impacts of tobacco control policies and lung cancer screening in the US and in middle-income nations, focusing on disparities in both smoking behavior and lung cancer risk.
- U01 CA199336 (Hur, Inadomi, Luebeck, Multi-PIs), National Institutes of Health/National Cancer Institute, Administrative Supplement to "Controlling Esophageal Cancer: A Collaborative Modeling Approach"

  Role: Consultant

  Duration: August 1, 2019 - July 31, 2020

  Description: This purpose of this administrative supplement is to develop practices to enhance model accessibility of the models developed within the Cancer Intervention and Surveillance Modeling Network (CISNET) consortium.
- U01 CA199218 (Mandelblatt, Berry, Lee, Plevritis, Trentham-Dietz, Multi-PIs), National Institutes of Health/National Cancer Institute, "Comparative Modeling: Informing Breast

[Cancer Control Practice & Policy"](#)
Funding Institute or Center: National Cancel Institute,

Role: Postdoctoral Fellow,

Duration: 09/01/2019–08/31/2020,

Description: The Breast Working Group has proposed new research on novel screening tests, strategies for management of DCIS, and evaluation of the impact of new systemic therapy approaches for metastatic disease.

- F32 CA220961 (**Toumazis I.**), Ruth L. Kirschstein National Research Service Award, National Institutes of Health/National Cancer Institute, ["Personalized, Dynamic Risk-based Lung Cancer Screening"](#)

  Role: Principal Investigator (PI)

  Duration: July 1, 2017 - June 31, 2019

  Description: This project focuses on the problem of optimizing lung cancer screening for asymptomatic individuals at risk.

Pending:

None

TEACHING EXPERIENCE

Instructor (with full teaching responsibilities)

Department of Industrial & Systems Engineering, University at Buffalo, SUNY, Buffalo, NY
- EAS 305: Applied Probability and Statistics Inference   Summer 2015, Enrollment: 18
- IE 320: Engineering Economy   Summer 2013, Enrollment: 28

Guest Lecturer

Department of Industrial & Systems Engineering, University at Buffalo, SUNY, Buffalo, NY
- IE 525: OR Applications in Healthcare (1 week)   Spring 2015
- IE 504: Facility Design (3 weeks)   Spring 2014
- IE 572: Linear Programming (1 week)   Fall 2013

Teaching Assistant

Department of Industrial & Systems Engineering, University at Buffalo, SUNY, Buffalo, NY
- EAS 305: Applied Probability and Statistics Inference (Undergraduate level)   Spring 2015
- IE 504: Facility Design (Graduate level)   Spring 2014
- IE 572: Linear Programming (Graduate level)   Fall 2013
- IE 514: Revenue Management (Graduate level)   Spring 2013
- IE 507: Design of Experiments (Graduate level)   Fall 2012

Tutor of Mathematics   09/2009 - 08/2010

ELC Private Institute, Limassol, Cyprus
- Responsible for the Mathematics Department
- Taught all high school levels

AWARDS & HONORS

- Best Poster Award, Integrative Biomedical Imagine Informatics at Stanford (IBIIS) Annual Retreat, Stanford University   2018
- IIE Doctoral Colloquium   2015
- Society for Health Systems Best Graduate Student Paper Competition winner   2015
- University Transportation Research Center (UTRC) Travel Award   2012

SERVICE TO PROFESSION

- Co-leader of the CISNET's Programmers Group, 2018–current
- Member of the 2018 Integrative Biomedical Imagine Informatics at Stanford (IBIIS) Annual Retreat Organizing Committee
- Session chair at INFORMS Annual Meetings, 2017 & 2018
- Session chair at IIE Annual Conference & Expo, 2015
- Ad-hoc Reviewer for Journals
    - European Journal of Operational Research (EJOR)
    - Annals of Mathematics & Artificial Intelligence
    - IIE Transactions on Healthcare Systems Engineering
    - Omega
    - Transportation Research Part D: Transport and Environment

PROFESSIONAL MEMBERSHIPS

- Institute for Operations Research and the Management Sciences (INFORMS)
- OmegaRho International Honor Society for Operations Research and Management Science
- Society for Medical Decision Making (SMDM)
- International Society for Pharmacoeconomics and Outcomes Research (ISPOR)
- International Association for the Study of Lung Cancer (IASLC)

COMPUTING SKILLS

- Programming Languages: Julia; Matlab; R
- Operative Systems: Windows, Macintosh
- Other Software: CPLEX Optimizer; Minitab; MS Office; ARENA; LaTex