Haema Nilakanta

Curriculum Vitae

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CV Last Updated: October 13, 2024

Summary Statement

Experienced data scientist with foundational training in statistics and an expertise in statistical computing and applied statistical methodology. Strong leader, statistical programmer, presenter, individual and team contributor, and dedicated to diversity and inclusion within the larger data science field.

Research Interests

Statistical Computing, Markov chain Monte Carlo, Network Analysis, Sampling, Population Research, Public Policy/Public Health, Inference, Forecasting, Causal Inference, Recommender Systems, Design of Experiments

Education

March 2020 **PhD, Statistics**, *University of Minnesota, Twin Cities*, Minneapolis, MN.,
Advisor: Prof. Galin Jones.
Dissertation: *Output Analysis of Monte Carlo Methods with Applications to Networks and Functional Approximation*

Feb 2018 **Master of Science, Statistics**, *University of Minnesota, Twin Cities*, Minneapolis, MN.

2012–2014 **Graduate coursework, Biostatistics**, *The George Washington University*, Washington D.C.

May 2011 **Bachelor of Science, Magna Cum Laude, Mathematics**, *Iowa State University*, Ames, IA.

Experience

Present **Principal Data Scientist**, *Target Corporation, Minneapolis, MN.*

- Director-level individual contributor and technical leader in developing models and algorithms that improve business planning and operations
- Mentorship of fellow data scientists
- Develop, deploy, and maintain production based systems
- Principal Data Scientist on the Demand Forecasting Engine:
  - Leader on larger team that provides unit demand forecasts as inputs to supply chain and planning initiatives
  - Focus area on disaggregation and anomaly detection methods
  - Strong cross-team collaboration with engineering partners
  - Established framework with traceable results and measurement pipelines
  - POC GenAI chatbot to help inventory analysts identify key dashboards to aid in RCA

- Principal Data Scientist on the Pricing and Promotions Insights:

  - Leader of team that oversaw pricing and merchandising models at Target
  - Developed a novel scorecard approach to evaluate price recommendations
  - Advised on building a scalable promotions-forecasting application
  - Weekly check ins and updates with business stakeholders

Oct 2019 - Oct 2022 **Lead Data/AI Scientist**, *Target Corporation, Minneapolis, MN*.

- Working with Target Tech Data Science Personalization Deals team to drive deal-based recommendations at scale
- Senior member and contributor in maintaining and upgrading production workflows, code reviews, and innovation work
- Reliable onboarding and technical mentor for new Deals team members
- Developing, deploying, and managing recommendation systems and prediction-based models
- Collaboration and coordination with other Target teams (e.g., promotions, pricing, Circle, etc.)
- Key Projects:

1. Generalized fallback: Led development of a productionized daily-run algorithm from scratch to generate non-personalized ranking of all offer types at Target
   - Contributions: Idea origination, end-to-end data pipeline, feature generation, modeling exploration & tuning, engineering collaboration, and validation
   - Modeling methods used: mixed effects models, penalized regression, time series based methods, seasonality decomposition, random forest
   - Coding: Hive, R, SparkR, Python, Shell, Oozie
2. Personalized recommendations of price based offers: Led development of a productionized daily-run algorithm from scratch to generate personalized recommendations of price based offers to all identifiable guests
   - Contributions: Idea origination, end-to-end data pipeline, feature generation, modeling exploration & tuning, engineering collaboration, and validation
   - Modeling methods used: mixed effects models, penalized logistic regression, general linear models, general additive models, random forest, Xgboost
   - Coding: Hive, R, Python, Pyspark, Shell, Oozie
3. Eligible Items: Collaborated on a real-time recommendation service to rerank items within an offer for guest relevancy (under patent review)
   - Contributions: feature generation, modeling exploration & tuning, engineering collaboration, and validation
   - Modeling methods used: word2vec, cosine similarity
   - Coding: Hive, Python, Pyspark, Shell, Oozie

Summer 2018 **Data Science Graduate Intern**, *Target Corporation, Minneapolis, MN*.

- 10 week internship with EDABI data science team
- Worked on an image processing and trend detection project

Summer 2017 **Graduate Intern**, *Savvysherpa Inc., Minneapolis, MN*.

- 12 week internship at a health care analytics company

- Worked with a small team on two projects
- Project 1: New health care member dynamic dis-enrollment prediction
- Project 2: FL Medicare patient-provider network analysis

Spr-Fall 2017 **Statistical Consultant**, *Forestry Department, University of Minnesota*.

- Collaborated with a graduate student and faculty on two oak wilt forestry projects
- Conducted statistical analyses for publications
- Provided forestry team `R` code and analysis reports

Spring 2017 **Graduate Research Assistant**, *School of Statistics, University of Minnesota*.

- Research with Dr. Zack Almquist
- On his ARO YIP grant, "Scalable Temporal Network Models with Population Dynamics: Estimation, Simulation, and Prediction"

Summer 2016 **Statistical Consultant**, *Psychology Department, University of Minnesota*.

- Consulting with the Frazier Stress and Trauma Lab in Counseling Psychology
- Collaborated with Dr. Patricia Frazier and two graduate students (manuscript under review)
- Worked on two projects: Daily diary study and Combined intervention study
- Responsible for: data cleaning, analysis, coding, manuscript statistics sections

Summer 2016 **Graduate Research Assistant**, *School of Statistics, University of Minnesota*.

- Research with Dr. Zack Almquist
- Created a social network sampling `R` package for network science practitioners to simulate and study differences in network sampling methods

Jan 2012 - July 2014 **Research Assistant**, *Biostatistics Center, The George Washington University*.

- Participated in several research projects where I have: maintained data for analyses, written R and SAS codes, ran reports, processed sequencing files, helped develop analysis plans, assembled datasets for public repositories, managed study websites, developed CRFs, facilitated IRB approval process, participated in manuscript development and collaborated with staff at Clinical, Sequencing, NIH, and Sponsor Centers
- Projects included:
  - Jan 2012-July 2014: Lung HIV Microbiome Project
    - PIs: Dr. Mary Foulkes and Dr. Kathleen Jablonski
  - July 2013-July 2014: Human Hookworm Vaccine Trial
    - PI: Dr. Kimberly Drews
  - Jan 2014-July 2014: Lifestyle Interventions for Expectant Mothers
    - PI: Dr. Elizabeth Thom
  - Jan 2012-Aug 2012: Diabetes Prevention Program, Genetics
    - PI: Dr. Kathleen Jablonski
  - Jan 2012-June 2012: Targeting Inflammation Using Salsalate in Type-2 Diabetes
    - PI: Dr. Kathleen Jablonski

Fall 2011 **Intern**, *Association for Women in Science*.

- Introduced AWIS to data visualization and analyses techniques for outreach and policy change materials
- Attended congressional meetings; advocated for women in STEM fields

Summer 2010 **Student Researcher**, *Applied Math NSF REU, North Carolina State University*.

- Worked in a team of four on an applied mathematical biology project modeling cell movement: "A Particle Method to Cell Movement"
- Research Adviser: Dr. Sharon Lubkin

Publications

Nilakanta, H., and Jones, G.L., Research Methods Foundation Project: Monte Carlo Simulation, SAGE Research Methods Foundations, edited by P. Atkinson, et al. (2020).

Nilakanta, H., Output Analysis Of Monte Carlo Methods With Applications To Networks And Functional Approximation, University of Minnesota Digital Conservancy (2020).

Nilakanta, H., Almquist, Z.W, and Jones, G.L., Ensuring Reliable Monte Carlo Estimates of Network Properties, (2019) *ArXiv*.

Baker, M.R., Nguyen-Feng, V.N., **Nilakanta, H.**, and Frazier, P.A., Childhood Maltreatment Predicts Daily Stressor Exposure in College Students, but not Perceived Stress or Stress Reactivity, *Journal of Counseling Psychology (2019)*.

Nilakanta, H., Drews, K.L., L Firrell, S., Foulkes, M.A. and Jablonski, K.A., A Review of Software for Analyzing Molecular Sequences, BMC Bioinformatics Research Notes, 7.1 (2014): 830.

Presentations

Invited & Contributed Talks

- University of Minnesota School of Statistics (November 2024, Minneapolis, MN)
  - *Guest Lecture - STAT 8801 Graduate Statistical Consulting*
- Iowa State University's Business Analytics Symposium (March 2023, Des Moines, IA)
  - *How Data Science is shaping the retail industry*
- Target Tech Q2 AI Virtual Floor Walk with Target CIO (July 2021, Minneapolis, MN)
  - *Digital & Marketing: Personalization for Price Based Offers & Content Targeting*
- Target Digital Data Sciences and Analytics Invited Talk (May 2021, Minneapolis, MN)
  - *Recommending Price Based Offers*
- Target Tech Demo Day (April 2021, Minneapolis, MN)
  - *Personalized Ranking of Promo Items*
- noRth Conference (July 2020, Minneapolis, MN)
  - *Being Bilingual: Coding in both R and Python*
- PhD Final Oral Exam, School of Statistics (January 2020, Minneapolis, MN)
  - *Output Analysis of Monte Carlo Methods with Applications to Networks and Functional Approximation*
- Biweekly Seminar, Target Corporation (November 2019, Minneapolis, MN)
  - *Output Analysis of Monte Carlo Methods with Applications to Networks and Functional Approximation*
- Business Analytics Symposium, Iowa State University (April 2019, Des Moines, IA)
  - *Shine with Shiny: An Introduction to R Shiny*
- Minnesota Population Center Seminar Series, University of Minnesota, Twin Cities (April 2018, Minneapolis, MN)
  - *Improved Network Sampling Measures with Applications to Population Research*
- Applied Probability and Statistics Seminar Series, University of St. Thomas (March 2018, St. Paul, MN)
  - *Sampling Networks with Random Walks*
- PhD Preliminary Oral Exam, School of Statistics (January 2018, Minneapolis, MN)
  - *Network Sampling via Random Walks*
- Activity Based Networks Workshop, SocInfo Conference (November 2016, Bellevue, WA)
  - *Network Sampling Techniques and Software for Online Social Networks*

Poster

- Population Association of America Annual Meeting (April 2018, Denver, CO)
- Statistics, Monte Carlo, and So Much More (April 2018, Minneapolis, MN)
- Doctoral Research Showcase (April 2018, Minneapolis, MN)
- International Society for Traumatic Stress Studies (November 2017, Chicago, IL)
  - Co-author: did not present
- ASA Women in Data Science Conference, (October 2017, La Jolla, CA)
  - Two presentations
- ASA Joint Statistical Meeting, (August 2017, Baltimore, MD)
- School of Statistics Advisory Board Meeting, (November 2016, Minneapolis, MN)
- ASA Twin Cities, Fall Research Conference, (October 2016, Mounds View, MN)
  - Best graduate poster prize
- School of Statistics Advisory Board Meeting, (November 2015, Minneapolis, MN)
- Society for Clinical Trials, (May 2014, Philadelphia, PA)
- Society for Clinical Trials, (May 2013, Boston, MA)
- Undergraduate Math Research Poster Competition, (May 2011, Ames, IA)
  - First place prize
- Nebraska Conf.for Undergraduate Women in Mathematics, (January 2011, Lincoln, NE)
- MAA Annual Conf. Undergraduate Poster Session, (January 2011, New Orleans, LA)
  - Undergraduate research poster award
- NCSU REU Poster Session, (August 2010, Raleigh, NC)

Teaching

University of Minnesota

2019 **Graduate Instructor**.

Spring 2019 STAT 3032-001: Regression and Correlated Data

2018 **Graduate Instructor**.

Fall 2018 STAT 3011-017: Introduction to Statistical Analysis

Fall 2018 STAT 3701: Introduction to Statistical Computing (covered initial 6 weeks)

Workshops.

Spring 2019 Day of Data Jam Session: Shine with Shiny: An Intro to R Shiny (Jan 11)

Fall 2017 STAT 5931: AEOP Workshop on Statistical Inference and R (Oct 12)

2014–2016 **Graduate Teaching Assistant**.

Fall 2014 STAT 1001: Introduction to the Ideas of Statistics (2)

Spring 2015 STAT 1001: Introduction to the Ideas of Statistics (2)

Summer 2015 STAT 3022: Data Analysis (1)

Fall 2015 STAT 4101: Mathematical Statistics (2)

Spring 2016 STAT 8102: Mathematical Statistics, Masters/PhD level (1)

Fall 2016 STAT 4893W: Consultation and Communication for Statisticians (1)

2013–2018 **Private Statistics Tutor**.

2010–2011 **Academic Tutor**, *Iowa State University Athletics Department*,
Tutored in Math, Biology and English.

Awards and Honors

Awarded by Target Corporation

July 2024 All Team Meeting Recognition for DS Supply Chain, Operations, DFE, and GenAI org
Oct 2023 SPOT Award – recognition for individual performance on a team
Sep 2023 Invited to attend 2023 Grace Hopper Conference
Jun 2022 Nominated by leadership to attend Target Tech Storytelling Training for leaders
Sep 2022 Invited to represent company at 2022 Grace Hopper Conference
Aug 2021 Invited to attend 2021 Grace Hopper Conference
Sep 2021 AI All team meeting recognition
Aug 2020 SPOT Award – recognition for individual performance on a team

Awarded by University of Minnesota

Spring 2019 Bernard W. Lindgren Graduate Instructor Award, School of Statistics
Spring 2018 Director's Award, School of Statistics
2017-2018 Graduate School Interdisciplinary Doctoral Fellowship
May 2017 Social Networks and Health Fellowship, via Duke University
Summer 2016 Lynn Lin Fellowship in Statistics, for promise in statistical consulting
Summer 2015 First Year Graduate Research Fellowship

Travel Awards

Oct 2017 Council of Graduate Students Conference Travel Grant, UMN
Oct 2017 School of Statistics Conference Travel Grant, UMN
Aug 2017 School of Statistics Conference Travel Grant, UMN
Nov 2016 School of Statistics Conference Travel Grant, UMN

Awarded by Iowa State University

2010 President's Leadership Initiative Award Winner
2010 Leadership Award, International Students and Scholars Office
2010-2011 Member, Mortar Board Torch Chapter, academic honors society
2010-2011 Member, Golden Key International Honour Society, academic and service honors society
2010-2011 Member, Phi Kappa Phi, academic honors society
2009-2011 Dean's List
2009 Multicultural Program Scholar

Awarded by Grinnell College

2008-2009 Dean's List
2008-2009 Hill Music Award Recipient
2008 Andrew Brody Scholarship Recipient

Leadership

Target Corporation

2023– **US Leadership Committee**, *Target Women In Data Sciences*.

University of Minnesota

2016-2017 **Elected VP of Finance**, *Graduate Students of Color Alliance*.
2015-2017 **Executive Board Member**, *Graduate Students of Color Alliance*.

Iowa State University

2010-2011 **Events Coordinator**, *Indian Students Association*.
2010-2011 **Committee Member**, *World Affairs Lecture Series*.
2009-2011 **President and Founder**, *UNICEF @ ISU*.

Grinnell College

2007-2009 **Co-President and Co-Founder**, *Grinnell College UNICEF Chapter*.
2007-2008 **Co-Leader**, *South Asian Festivals Group*.

Service

Target Corporation

2023-Present US Chair of Small Moments Workstream for Target Women in Data Science, *Target Tech*.
Aug 2021 Panelist for AI Event at Grace Hopper Conference, *Target Tech*.
2020-Present Member of the Data And Inclusion (DAC) Group, *Target Data Sciences*.
Dec 2020 Data Science 4 All Mentor, *Target Data Sciences with Correlation 1*.

University of Minnesota

Spring 2019 Panelist for undergraduate statistics consulting class, *School of Statistics*.
Fall 2018 Grant Reviewer, *Council of Graduate Students*.
Spring 2018 Grant Reviewer, *Council of Graduate Students*.
2017-2018 Organizer for Student Talks Seminar Series, *School of Statistics*.
Summer 2017 Co-Teacher for Teaching Assistant Training/Orientation, *School of Statistics*.
Fall 2016 Panelist for graduate school panel for undergraduate consulting class, *School of Statistics*.
Fall 2016 Graduate student co-organizer, Advisory Board panel, *School of Statistics*.
2015-2016 Graduate student space remodeling committee member, *School of Statistics*.
2015-2016 Happy hour co-chair, *School of Statistics*.
March 2016 Panelist for Diversity in Education, *Education Minnesota*.
Nov 2015 Panelist for grad panel, *GSOCA*.

Other

March 2020 Visiting industry speaker for Dr. Christina Knudson's class - "careers in statistics", *University of St. Thomas, St. Paul, MN*.
2017-2023 Volunteer GED math tutor, *Minneapolis Community Education MPS, Minneapolis, MN*.

Skills

Programming R, Python, Spark (Pyspark and SparkR), SAS, Hadoop, Hive, Oozie, SQL, Shell

Statistical and Machine Learning methods Regression, General Linear Models, General Additive Models, Mixed Methods, Hierarchical Modeling, Bayesian Modeling, Regularization, Time Series, Survival Analysis, Experimental Design (A/B testing), Parametric and Non-parametric Methods, Cross Validation, Classification, NLP, Decision Trees, Random Forests, Boosting & Bagging Methods, Neural Networks, Recommender Systems, Simulation-based Approaches

Operating Systems	Mac, Windows, Linux
Other Tools	Git, Github Copilot, LaTeX, Microsoft Office, Keynote, Pages
Other	Confident public speaker, strong communication skills, adaptable

Affiliations and Memberships

- American Statistical Association (ASA)
- ASA Caucus for Women in Statistics (ASA CWS)
- Statistics Without Borders (SWB)
- R-Ladies Twin Cities Chapter
- Target Business Councils: Women's Business Council, Asian Business Council
- The Association for Women in Science (AWIS)
- University of Minnesota Alumni Association
- Iowa State University Alumni Association
- Alumnus of Community of Scholars Program (COSP), University of Minnesota
- Alumnus of Minnesota Population Center (MPC) Graduate Student Member, University of Minnesota
- Alumnus of Graduate Students of Color Alliance (GSOCA), University of Minnesota
- Alumnus of Council of Graduate Students (COGS), University of Minnesota