ANJANA ARUNKUMAR

@ aarunku5@asu.edu   % https://aarunku5.github.io/   G Google Scholar   🐦 @ArunkumarAnjana   in LinkedIn

✉ 699 S. Mill Ave, Suite 411, Tempe, Arizona, 85281

RESEARCH INTERESTS

My research interests lie at the intersection of visual cognition, technological literacy, natural language, virtual reality, and data visualization. Specifically, I investigate how visualization aesthetics and affordances influence decision-making, and build visual analytics pipelines. I also have a background in exploring bias in natural language models, learning from instructions/prompting, and investigating the influence of visualization techniques in supply chain and project management.

EDUCATION

Arizona State University
Ph.D. in Computer Science

📅 August 2019 – Present

- Research Assistant at Sonoran Visualization Laboratory, School of Computing and Augmented Intelligence.

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Meenakshi Sundararajan Engineering College (Anna University)
B.E. in Computer Science and Engineering

📅 June 2015-May 2019

- Anna University Gold Medal Recipient (2015-19), for 1st Rank in B.E. Computer Science and Engineering amongst 15000 students
- Published in 2 conferences and 1 journal as primary contributor.

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ACHIEVEMENTS

- Awardee of Gerald Farin Memorial Fellowship, ASU, 2023.
- Honorable Mention in VAST challenge, 2020.
- Finalist in Undergraduate Poster competition, NEDSI 2018.

RESEARCH INTERNSHIPS

National Renewable Energy Laboratory

📅 June 2023 – August 2023 at Golden, CO, USA

- Use of React-Native, Python to implement touchscreen interactions for power system visualization exploration.
- Performing touch gesture-tracking to implement auto-detection of user uncertainty during visualization viewing.
- Implementing auto-reconfiguration of visualization appearance to resolve user difficulties and validating with a human subject study.

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Paragon Digital Services Pvt. Ltd., Dentsu Aegis

📅 December 2018 – April 2019 at Chennai, TN, India

- Use of R, Python to implement intelligent client-product recommendation interface via abstractive summarization.
- Performing granular sentiment detection, using a recurrent neural network approach, over a dataset of online reviews for Slack.
- Building a client interface, flagging sentiments and sarcasm in opinion units, and generating an interactive visualization dashboard of the same.

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Paragon Digital Services Pvt. Ltd., Dentsu Aegis

📅 June 2018 - August 2018 at Chennai, TN, India

- Training in Data Analysis Techniques, Digital Marketing and Business Intelligence Tools.

- Analysis of chain stores for profit analysis and factors: use of Tableau and SQL to make recommendations regarding marketing strategies for client products.
- Survey design and ad campaign structuring for an image publishing service company using Google Data Studio.
- Use of R tool/Python to implement classification algorithms on data sets for an optical wear company.

PUBLICATIONS – PEER REVIEWED JOURNAL PUBLICATIONS

1. Comparing Collaborative Visualization Behaviors in Desktop and Augmented Reality Environments
   Michael Kintscher, Jinbin Huang, **Anjana Arunkumar**, Ashish Amresh, and Chris Bryan
   VRST, 2023

2. Image or Information? Examining the Nature and Impact of Visualization Perceptual Classification 🔊[1]
   Anjana Arunkumar*, Lace Padilla, Gi-Yeul Bae, and Chris Bryan
   IEEE Visualization Conference, 2023

3. LINGO: Visually Debiasing Natural Language Instructions to Support Task Diversity 🔊
   Anjana Arunkumar*, Shubham Sharma, Rakhi Agrawal, Sriram Chandrasekaran, and Chris Bryan
   Eurovis, 2023

4. Real-Time Visual Feedback to Guide Benchmark Creation: A Human-and-Metric-in-the-Loop Workflow 🔊
   Anjana Arunkumar*, Swaroop Mishra, Bhavdeep Sachdeva, Chitta Baral, and Chris Bryan
   EACL, 2023

5. PMU Tracker: A Visualization Platform for Epicentric Event Propagation Analysis in the Power Grid 🔊
   Anjana Arunkumar*, Andrea Pinceti, Lalitha Sankar, and Chris Bryan
   IEEE Visualization Conference, 2022

6. PMUVis: A Large Scale Platform to Assist Power System Operators in a Smart Grid
   Anjana Arunkumar*, Nitin Gupta, Andrea Pinceti, Lalitha Sankar, and Chris Bryan
   IEEE Computer Graphics and Applications, 2022

7. Benchmarking Generalization via In-Context Instructions on 1,600+ Language Tasks.
   Swaroop Mishra*, Yizhong Wang*, Pegah Alipoormolabashi, Yeganeh Kordi, Amirreza Mirzaei, **Anjana Arunkumar** et. al..Chitta Baral, Yejin Choi, Noah A. Smith, Hannaneh Hajishirzi, Daniel Khashabi
   EMNLP 2022

8. How Robust are Model Rankings : A Leaderboard Customization Approach for Equitable Evaluation 🔊
   Swaroop Mishra*, **Anjana Arunkumar***
   AAAI 2021

9. Bayesian Modelling of Alluvial Diagram Complexity 🔊
   Anjana Arunkumar*, Shashank Ginjpalli, and Chris Bryan.
   IEEE Visualization Conference, 2021

PUBLICATIONS – PEER REVIEWED CONFERENCE PUBLICATIONS

1. Examining the Effect of Visualization Proxemics on Decision Making using Touchscreen Dashboards 🔊
   Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
   Decision Sciences Institute Annual Conference, 2023

2. Automated Construction of Business Intelligence Dashboards Using Artificial Intelligence Tools 🔊
   Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
   Decision Sciences Institute Annual Conference, 2023

3. Examining The Effects of Visual Redundancy on Understanding Uncertainty Representations in Schedule Risk Analysis 🔊
   Anjana Arunkumar*, Daniel Ortiz, and Arun Madapusi
   Southwest Decision Sciences Institute Annual Conference, 2023

4. Examining the Effect of Reconfiguration Interactions on Understanding Uncertainty in Supply Chain Disruption 🔊
   Anjana Arunkumar*, Daniel Ortiz, and Arun Madapusi
   Southwest Decision Sciences Institute Annual Conference, 2023

5. Examining the Effect of Visual Redundancy on the Understanding of Visualizations in Procurement and Sourcing 🔊
   Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
   Decision Sciences Institute Annual Conference, 2022

6. Examining the Effect of Reconfiguration Interactions on the Understanding of Anomalies in Supply Chain Management 🔊
   Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
   Decision Sciences Institute Annual Conference, 2022

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[1]🔊 indicates a conference presentation

7. Evaluation of Visual Uncertainty Representations in Schedule Risk Analysis 🔊
Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
Midwest Decision Sciences Institute Annual Conference, 2022

8. Modelling the Complexity of Risk Centered Supply Chain Network Visualization 🔊
Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
Midwest Decision Sciences Institute Annual Conference, 2022

9. Impact of Uncertainty Representation on Decision Making for Business Network Visualization 🔊
Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
Decision Sciences Institute Annual Conference, 2021

10. Bayesian Modelling of Uncertainty in Schedule Risk Analysis using Gantt Charts 🔊
Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
Decision Sciences Institute Annual Conference, 2021

11. Modelling the Complexity of Supply Chain Network Visualization 🔊
Anjana Arunkumar*, Daniel Ortiz, Arunkumar Madapusi
Decision Sciences Institute Annual Conference, 2021

12. Strategy-Enterprise System Alignment and Firm Performance 🔊
Anjana Arunkumar*, Arunkumar Madapusi*
Northeast Decision Sciences Institute Annual Conference, 2021

13. Investigating the Influence of Top Management Support in Systemic Enterprise System Deployments 🔊
Anjana Arunkumar*, Arunkumar Madapusi*
Decision Sciences Institute Annual Conference, 2020

14. Examining Data Visualization's Impact on Decision Making 🔊
Anjana Arunkumar*, Arunkumar Madapusi
Decision Sciences Institute Annual Conference, 2020

15. Investigating the Influence of Chart Embellishment on Decision Making 🔊
Anjana Arunkumar*, Arunkumar Madapusi
Decision Sciences Institute Annual Conference, 2020

16. Integration Mechanisms, Absorptive Capacity, Enterprise Systems 🔊
Anjana Arunkumar*, Arunkumar Madapusi*
Decision Sciences Institute Annual Conference, 2019

17. Relational Capital Enterprise Systems 🔊
Anjana Arunkumar*, Arunkumar Madapusi*
Decision Sciences Institute Annual Conference, 2019

18. The Role of Consultants in Enterprise Systems 🔊
Anjana Arunkumar*, Arunkumar Madapusi*
Decision Sciences Institute Annual Conference, 2019

19. Abstractive Summarization Through Sentiment Analysis Of User Product Reviews - An RNN Approach 🔊
Anjana Arunkumar*, Sandhya, M.K.
Decision Sciences Institute Annual Conference, 2019

20. Active Learning Methodology: Bridging Theory and Practice 🔊
Anjana Arunkumar*, Sandhya, M.K.*, Arunkumar Madapusi*
Southwest Decision Sciences Institute Annual Conference, 2019

21. ES Configurations and their Impact on firm Performance 🔊
Anjana Arunkumar*, Monica Jenefer, Arunkumar Madapusi*
Southwest Decision Sciences Institute Annual Conference, 2019

22. The Role of Moderators in ERP System Deployment Success 🔊
Anjana Arunkumar*, Monica Jenefer, Arunkumar Madapusi*
Southwest Decision Sciences Institute Annual Conference, 2019

23. Competences Influencing Absorptive Capacity in Enterprise Systems 🔊
Anjana Arunkumar*
Decision Sciences Institute Annual Conference, 2018

24. Enterprise System Configuration and Performance 🔊
Anjana Arunkumar*
Decision Sciences Institute Annual Conference, 2018

25. The Influence of Alignment in Enterprise System Deployments 🔊
Anjana Arunkumar*
Decision Sciences Institute Annual Conference, 2018

26. Absorptive Capacity in Enterprise Systems 🔊
Anjana Arunkumar*, Arunkumar Madapusi

Northeast Decision Sciences Institute Annual Conference, 2018 **(Finalist : Undergraduate Poster Competition)**

27. Configuring SME Enterprise Systems 🔊
    Anjana Arunkumar*, Arunkumar Madapusi*
    Northeast Decision Sciences Institute Annual Conference, 2018

28. Critical Success Factors in Enterprise Systems 🔊
    Anjana Arunkumar*, Arunkumar Madapusi*
    Northeast Decision Sciences Institute Annual Conference, 2018

29. The Influence of Competency Factors in Enterprise System Deployments 🔊
    Arunkumar Madapusi*, **Anjana Arunkumar**
    Decision Sciences Institute Annual Conference, 2017

30. The Influence of Knowledge Capabilities in Enterprise System Deployments 🔊
    Arunkumar Madapusi*, **Anjana Arunkumar**
    Decision Sciences Institute Annual Conference, 2017

31. The Influence of Knowledge Capital in Enterprise System Deployments 🔊
    Arunkumar Madapusi*, **Anjana Arunkumar**
    Decision Sciences Institute Annual Conference, 2017

PUBLICATIONS – PEER REVIEWED WORKSHOP PAPERS

1. A Visual Exploration of Fair Evaluation for ML - Bridging the Gap Between Research and the Real World 🔊
   Anjana Arunkumar*, Swaroop Mishra, Chris Bryan
   Visualization for AI Explainability (VISxAI workshop), IEEE Visualization Conference, 2020

2. DQI: A Guide to Benchmark Evaluation
   Swaroop Mishra*, **Anjana Arunkumar**, Bhavdeep Sachdeva, Chris Bryan, Chitta Baral
   Uncertainty Robustness in Deep Learning Workshop, ICML, 2020

3. Our Evaluation Metric Needs an Update to Encourage Generalization 🔊
   Swaroop Mishra*, **Anjana Arunkumar**, Chris Bryan, Chitta Baral
   Uncertainty Robustness in Deep Learning Workshop, ICML, 2020

4. VAIDA: An Educative Benchmark Creation Paradigm using Visual Analytics for Interactively Discouraging Artifacts 🔊
   Swaroop Mishra*, **Anjana Arunkumar***, Bhavdeep Sachdeva, Chris Bryan, Chitta Baral
   Crowd Science Workshop: Remoteness, Fairness, and Mechanisms as Challenges of Data Supply by Humans for Automation, NeurIPS, 2020

5. Real-Time Visual Feedback for Educative Benchmark Creation: A Human-and Metric-in-the-Loop Workflow Artifacts 🔊
   Anjana Arunkumar*, Swaroop Mishra, Bhavdeep Singh Sachdeva, Chitta Baral, Chris Bryan
   HAMLETS (Human And Machine in-the-Loop Evaluation and Learning Strategies Workshop), NeurIPS, 2020

6. Front Contribution instead of Back Propagation
   Swaroop Mishra*, **Anjana Arunkumar**
   Beyond Backpropagation: Novel Ideas for Training Neural Architectures (Workshop), NeurIPS, 2020

7. Is High Quality Data All You Need?
   Swaroop Mishra*, **Anjana Arunkumar**, Bhavdeep Sachdeva
   The pre-registration experiment: an alternative publication model for machine learning research (Workshop), NeurIPS, 2020

PUBLICATIONS – PEER REVIEWED CONTEST ENTRIES

1. TotemFinder: A Visual Analytics Approach for Image-based Key Players Identification
   Jinbin Huang*, Aditi Mishra, **Anjana Arunkumar**, Chris Bryan
   VAST Challenge, IEEE Visualization Conference, 2020 **(Honorable Mention)**

INVITED TALKS

1. Data Visualization Design for the Mind's Eye: Internalizing What's In Sight
   Emory University, October 2023.

2. What's In-Sight: How We Truly Internalize Data Visualizations
   University of Victoria, September 2023.

3. Designing Touchscreen Interactions to Resolve User Uncertainty in Spatiotemporal Analysis with Maps
   National Renewable Energy Laboratory, July 2023.

4. Examining Signifiers and Affordances in Data Visualization
   Arizona State University, October 2021.

5. Data Breach Chronicles: Lessons from Cyber Forensics Case Studies
   Meenakshi Sundararajan Engineering College, October 2019

6. Text Mining for Pattern Detection in Digital Forensics
   Meenakshi Sundararajan Engineering College, October 2018

7. Data Mining in Criminology – Crime Analysis and Hotspot Mapping
   Madras Institute of Technology, September 2018

8. Beyond Metrics: Enhancing Quality with Six Sigma and Benchmarking
   Meenakshi Sundararajan Engineering College, October 2017

9. Biomimicry in Robotics: Electronic Skin for Insect-Inspired Models
   Loyola-ICAM College of Engineering and Technology, September 2017

10. Smart Skin: How Electronic Skin Technology is Transforming Wearable Devices
    Meenakshi Sundararajan Engineering College, October 2016

TEACHING EXPERIENCE

Teaching Assistant
Data Visualization, CSE 578

Fall 2022, ASU : Students learn about techniques and algorithms for creating effective visualizations based on principles from graphic design, visual art, perceptual psychology and cognitive science to enhance the understanding of complex data.

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Teaching Assistant
Database Management, CSE 412

Fall 2019, ASU : Students are introduced to DBMS concepts. Data models and languages. Relational database theory. Database security/integrity and concurrency.

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Teaching Assistant
Data Structures and Algorithms, CSE 310

Fall 2019, ASU : Students learn about advanced data structures and algorithms, including stacks, queues, trees (B, B+, AVL), and graphs. Searching for graphs, hashing, external sorting.

SERVICE

- **Organizer:**
  - Program Commitee Member of Vizsec 2023 (@IEEE VIS)
  - Program Commitee Member of EnergyVis 2023 (@IEEE VIS)
  - Program Commitee Member of EMNLP Industry Track 2023
  - Program Commitee Member of ACL 2023
  - Program Commitee Member of EMNLP 2022–2023
  - Program Commitee Member of VLDB 2021 Crowd Science Workshop
  - Organizer of E3 symposium 2016-18 at Meenakshi Sundararajan Engineering College (Anna University)
  - Organizer of Kranti symposium 2016-18 at Meenakshi Sundararajan Engineering College (Anna University)
- **Session Chair:**
  - DSI 2021: Supply Chain Management, Project Management
  - DSI 2020: Business Analytics, Information Technology Management
  - DSI 2019: Business Analytics
- **Reviewer:**
  - Visualization/HCI: IEEE Vis, TVCG, PacificVis, EuroVis, ACM SIGCHI, VRST, VAST
  - NLP/ML: EMNLP, ACL, EACL, ICML, NAACL, NeurIPS, Data Technologies and Applications
  - Management: DSI, SWDSI, NEDSI, MWDSI
- **Mentorship**:
  ASU: Shashank Ginjpalli, Nitin Gupta, Bhavdeep Sachdeva, Shubham Sharma, Jose Elenes, Jaimie Liu, Jai Narula, Arshdeep Sachdeva, Dhrumil Joshi, Vedant Vijay.

TECHNICAL SKILLS

Languages

- Python, R, C, C++, MySQL, Kotlin, Perl

Web Technologies

- D3.js, JavaScript, JSON, NodeJS, HTML, CSS, JQuery, WordPress, Java, XML, Kivy, React, React-Native

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Machine Learning Frameworks

- Scikit-Learn, Tensorflow, Keras, NLTK, PyTorch, Huggingface

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Tools

- Tableau, Gephi, MATLAB, Git, SPSS, LaTeX, Colab, Eclipse, Google Data Studio

RELEVANT COURSEWORK

- **ASU**: Data Visualization, Natural Language Processing, Current issues in Visual Cognition, Current Issues in Cognitive Science, Statistical Machine Learning: From Theory to Algorithms, Data Mining, Foundation of Algorithms, Artificial Intelligence, Mobile Computing, and Information Assurance & Security.
- **Anna University:** Engineering Graphics, Database Management Systems, Computer Networks, Operating Systems, Software Engineering, Internet Programming, Object Oriented Analysis & Design, Computer Graphics, Cryptography and Network Security, Grid and Cloud Computing, Adhoc and Sensor Networks, Human Computer Interaction, Neural Networks

LANGUAGES SPOKEN

- English- Native Proficiency
- Tamil- Native Proficiency
- Hindi- Professional working proficiency
- Japanese (N4) - Limited working proficiency
- Sanskrit - Professional working proficiency

EXTRA CURRICULAR ACTIVITIES

- Member of the AI Club @ASU, 2019–2023
- Member of the Women in STEM Club @ASU, 2019–2023
- Member of the Graduate and Professional Student Association @ASU 2019-2023
- Mentor, ASA DataFest Competition 2023
- Member of the Computer Society of India, 2019–2023
- Member of the Lions Club
- Member of the Interact Club/Rotary International
- Quizzing and Trivia
- Well-versed in Violin, Vocal Music, and Art Media