Date: June 17, 2021   Name: Arvind Satyanarayan
                                  Department: Electrical Engineering and
                                                  Computer Science

1. Date of Birth: July 1989

2. Citizenship: India (U.S. Permanent Resident)

3. Education:

School	Degree	Date
University of California, San Diego	B.S.	June 2011
Stanford University	M.S.	June 2014
Stanford University	Ph.D.	Sept. 2017

4. Title of Thesis for Most Advanced Degree:

   Declarative Interaction Design for Data Visualization

5. Principal Fields of Interest:

   Interactive Data Visualization; Human-Computer Interaction; Machine Learning
   Interpretability.

6. Name and Rank of Other Department Faculty in the Same Field:

   Randall Davis, Professor
   Daniel Jackson, Professor
   David R. Karger, Professor
   Robert C. Miller, Professor
   Tim Kraska, Associate Professor (without tenure)
   Stefanie Mueller, Associate Professor (without tenure)

7. Name and Rank of Faculty in Other Departments in the Same Field:

   Fox Harrell, Professor (Comparative Media Studies)
   Sarah Williams, Professor (Urban Studies)
   Catherine D'Ignazio, Assistant Professor (Urban Studies)

8. Non-MIT Experience (including military service):

Employer	Position	Beginning	Ending
Apropose, Inc.	Co-Founder, Chief Architect	Sept. 2013	June 2014
Apropose, Inc.	Co-Founder, Advisor	June 2014	Sept. 2016
University of Washington	Part-Time Lecturer	Dec. 2015	March 2016
Google Brain Team	Postdoctoral Research Scientist	Oct. 2017	June 2018

9. History of MIT Appointments:

Rank	Beginning	Ending
Assistant Professor, EECS	July 2018	Present

10. Consulting Record:

None

11. Department and Institute Committees, Other Assigned Duties:

Activity	Beginning	Ending
CSAIL HCI Seminar Series Chair	July 2018	Present
Stata Architecture Committee	March 2019	June 2019
EECS Committee on Diversity, Equity, and Inclusion	Nov. 2019	Present
SERC Case Studies Editorial Board	Dec. 2019	Present
EECS Graduate Admissions Chair: HCI Area	Dec. 2019	Apr. 2020
SERC Dean's Action Group on Active Learning Projects	Jan. 2020	June 2020

12. Professional service:

Activity	Beginning	Ending
ACM CHI Conference Interactive Schedule Co-Chair	June 2012	May 2013
OpenVis Conference Program Committee	Oct. 2016	May 2018
ACM CHI Conference Late-Breaking Work Program Committee	Dec. 2016	May 2017
National Science Foundation (NSF), Review Panelist	Jan. 2018	Dec. 2018
IEEE VIS Conference Program Committee	Jan. 2018	Oct. 2020
Information+ Conference Program Committee	May 2018	Present
Information+ Conference Diversity & Inclusivity Committee	May 2018	Oct. 2018
IEEE VIS Conference Diversity Scholarship Committee	July 2018	Oct. 2020
Distill Journal Co-Editor	Aug. 2018	Sept.2020
ACM IUI Program Committee	Sept. 2018	Mar. 2021
OpenVis Conference Program Co-Chair	Oct. 2018	May 2018
IEEE VIS Conference Diversity & Inclusion Co-Chair	Nov. 2018	Oct. 2020
National Science Foundation (NSF), Review Panelist	Jan. 2019	Dec. 2019
IEEE Visualization & Graphics Technical Committee (VGTC) Publications Chair	Sept. 2019	Present
National Science Foundation (NSF), Review Panelist (x2)	Jan. 2020	Dec. 2020
Information+ Conference Program Committee	Jan. 2021	Oct. 2021
IEEE Ad Hoc Committee on Diversity & Inclusion	March 2021	Present
IEEE VIS Conference Publications Chair	Dec. 2021	Present

13. Awards Received:

Award	Date
Revelle College Provost's Honors, University of California, San Diego (UCSD)	Sept. 2008— —June 2010

Revelle College Ernest Mort Award for Excellence in Leadership (UCSD)	June 2009
Revelle College Ernest Mort Award for Excellence in Leadership (UCSD)	June 2010
Outstanding Senior, UCSD Alumni Association	June 2011
Stanford Graduate Fellowship	Sept. 2011
ACM CHI Best Paper Award	May 2013
Kantar Information is Beautiful Award Shortlist Nominee	Nov. 2015
Google PhD Fellowship	March 2016
IEEE InfoVis Best Paper Award	Oct. 2016
MIT Teaching with Digital Technology Award Nominee	May 2019
NSF CAREER Award	March 2020
MIT EECS Kolokotrones Education Award	June 2020
National Academy of Science Kavli Fellow	July 2020
Google Research Scholar Award	March 2021
ACM CHI Best Paper Honorable Mention	May 2021
MIT EECS Seth J. Teller Award for Excellence, Inclusion and Diversity	June 2021

14. Current Organization Membership:

Organization	Offices Held
ACM	Member, Sept. 2011–present
IEEE	Member, Sept. 2014–present

15. Patents and Patent Applications Pending:

None

16. Professional Registration:

None

17. Major New Products, Processes, Designs, or Systems:

Vega (http://vega.github.io/vega/), an open source visualization toolkit that has been deployed on Wikipedia and has over 9,000 stars on GitHub.

Vega-Lite (http://vega.github.io/vega-lite/), an open source visualization toolkit that is widely used in industry (e.g., at Apple, Google, and Microsoft) and in data science communities.

Lyra (http://vega.github.io/lyra/), an open source visualization design environment (VDE) that is used by approximately 100 people / month.

Educational Contributions Other Than Classroom Teaching of Arvind Satyanarayan

1. Teaching materials developed that illustrate teaching effectiveness or innovativeness:

    i.   Restructured the syllabus for "6.170: Software Studio" to have a stronger focus on human-computer interaction, user-centric design methods, and the social & ethical responsibilities of computing. This involved developing new lecture material and assignments. This took place over Fall 2019 and Fall 2020.
    ii. Created a new permanent subject "6.859: Interactive Data Visualization" (first offered as a temporary subject "6.894: Interactive Data Visualization" in Spring 2019) to expand the human-computer interaction curriculum in the EECS department. Topics include exploratory and explanatory visualization techniques, perceptual theories, and hands on session with visualization tools (including Vega-Lite, Tableau, and D3.js). Materials from this class have been reused by others including Prof. Maneesh Agrawala at Stanford University, Prof. Jeffrey Heer at the University of Washington, and Prof. Petra Isenberg at the Université Paris-Saclay.
    iii. Delivered two guest lectures on research in interactive data visualization and machine learning interpretability in "6.UAR: Preparation for Undergraduate Research" in Fall 2019 and Fall 2020.

2. Education contributions, apart from classroom performance and supervision, such as new educational programs and curricula developed by the candidate:

    i.   Speaker at the EECS Campus Preview Weekend, Spring 2021.
    ii. Faculty mentor in the MIT Summer Research Program (MSRP), Summer 2021.

3. Contributions to the educational commons:

    i.   Supervised 10 UROPs on projects that have produced:
        (1) Extensions to the open source Vega-Lite software by Allen Lee (MIT EECS) in Spring 2019.
        (2) Research publications with UROP co-authorship from Dhiraj Barnwal (IIT Kharagpur, India), Rupayan Neogy (MIT EECS) and Tanya Yang (MIT EECS) (i.e., 2.10, 3.8, 3.10 below) from Summer 2019 through Summer 2020.
        (3) An interactive article of a research publication (http://vis.csail.mit.edu/covid-story/) that has been read by over 15,000 readers within one month of release. UROPs included Anna Arpaci-Dusseau (MIT EECS), Soomin Chun (MIT EECS + Math), Katherine Huang (MIT CMS), Anna Meurer (MIT MechE), Mateo Monterde (MIT Math + Management), Ethan Nevidomsky (MIT EECS + CMS), Tanya Yang (MIT EECS) who worked through Fall 2020 and IAP 2021.

Publications of Arvind Satyanarayan

1. Books

    None

2. Papers in Refereed Journals

    2.1. Arvind Satyanarayan and Jeffrey Heer. "Lyra: An Interactive Visualization Design Environment." In Computer Graphics Forum, vol. 33, no. 3 (2014). pp. 351-360

    2.2. Arvind Satyanarayan and Jeffrey Heer. "Authoring Narrative Visualizations with Ellipsis." In Computer Graphics Forum, vol. 33, no. 3 (2014). pp. 361-370

    2.3. Arvind Satyanarayan, Ryan Russell, Jane Hoffswell, and Jeffrey Heer. "Reactive Vega: A Streaming Dataflow Architecture for Declarative Interactive Visualization." IEEE Transactions on Visualization and Computer Graphics, vol. 22, no. 1 (2016). pp. 659-668

    2.4. Jane Hoffswell, Arvind Satyanarayan, and Jeffrey Heer. "Visual Debugging Techniques for Reactive Data Visualization." In Computer Graphics Forum, vol. 35, no. 3 (2016). pp. 271-280

    2.5. Arvind Satyanarayan, Dominik Moritz, Kanit Wongsuphasawat, and Jeffrey Heer. "Vega-Lite: A Grammar of Interactive Graphics." IEEE Transactions on Visualization and Computer Graphics 23, no. 1 (2017). pp. 341-350

    2.6. Chris Olah, Arvind Satyanarayan, Ian Johnson, Shan Carter, Ludwig Schubert, Katherine Ye, and Alexander Mordvintsev. "The Building Blocks of Interpretability." Distill, vol. 3, no. 3 (2018).

    2.7. Jacob VanderPlas, Brian E. Granger, Jeffrey Heer, Dominik Moritz, Kanit Wongsuphasawat, Arvind Satyanarayan, Eitan Lees, Ilia Timofeev, Ben Welsh, and Scott Sievert. "Altair: Interactive Statistical Visualizations for Python." Journal of Open Source Software, vol. 3, no. 32 (2018). 2pp

    2.8. Arvind Satyanarayan, Bongshin Lee, Donghao Ren, Jeffrey Heer, John Stasko, John Thompson, Matthew Brehmer, and Zhicheng Liu. "Critical Reflections on Visualization Authoring Systems." IEEE Transactions on Visualization and Computer Graphics, vol. 26, no. 1 (2020). pp. 461-471

    2.9. Aspen K. Hopkins, Michael Correll, and Arvind Satyanarayan. "VisuaLint: Sketchy In Situ Annotations of Chart Construction Errors." In Computer Graphics Forum, vol. 39, no. 3 (2020). pp. 219-228 **

    2.10. Jonathan Zong, Dhiraj Barnwal, Rupayan Neogy, and Arvind Satyanarayan. "Lyra 2: Designing Interactive Visualizations by Demonstration." IEEE Transactions on Visualization and Computer Graphics, vol. 27, no. 2 (2021). pp. 304-314 **

3. Proceedings of Refereed Conferences

    3.1. Arvind Satyanarayan, Nadir Weibel, and James Hollan. "Using Overlays to Support Collaborative Interaction with Display Walls." In Proceedings of the ACM Conference on Intelligent User Interfaces (IUI) (2012). pp. 105-108

    3.2. Ranjitha Kumar, Arvind Satyanarayan, Cesar Torres, Maxine Lim, Salman Ahmad, Scott R. Klemmer, and Jerry O. Talton. "Webzeitgeist: Design Mining the Web." In

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** Outgrowth of supervised student research

Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI) (2013). pp. 3083-3092

3.3. Arvind Satyanarayan, Kanit Wongsuphasawat, and Jeffrey Heer. "Declarative Interaction Design for Data Visualization." In Proceedings of the ACM Symposium on User Interface Software and Technology (UIST) (2014). pp. 669-678

3.4. Jane Hoffswell, Arvind Satyanarayan, and Jeffrey Heer. "Augmenting Code with In Situ Visualizations to Aid Program Understanding." In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI) (2018). pp. 1-12

3.5. Alan Lundgard, Crystal Lee, and Arvind Satyanarayan. "Sociotechnical Considerations for Accessible Visualization Design." In Proceedings of the IEEE Visualization Conference (VIS) (2019). pp. 16-20 **

3.6. Madelon Hulsebos, Kevin Hu, Michiel Bakker, Emanuel Zgraggen, Arvind Satyanarayan, Tim Kraska, Çagatay Demiralp, and César Hidalgo. "Sherlock: A Deep Learning Approach to Semantic Data Type Detection." In Proceedings of the ACM Conference on Knowledge Discovery & Data Mining (KDD) (2019). pp. 1500-1508

3.7. Kevin Hu, Snehalkumar "Neil" S. Gaikwad, Madelon Hulsebos, Michiel A. Bakker, Emanuel Zgraggen, César Hidalgo, Tim Kraska, Guoliang Li, Arvind Satyanarayan, and Çagatay Demiralp. "VizNet: Towards a Large-Scale Visualization Learning and Benchmarking Repository." In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI) (2019). pp. 1-12

3.8. Rupayan Neogy, Jonathan Zong, and Arvind Satyanarayan. "Representing Real-Time Multi-User Collaboration in Visualizations." In Proceedings of the IEEE Visualization Conference (VIS) (2020). pp. 146-150. **

3.9. Yifan Wu, Joseph M. Hellerstein, and Arvind Satyanarayan. "B2: Bridging Code and Interactive Visualization in Computational Notebooks." In Proceedings of the ACM Symposium on User Interface Software and Technology (UIST) (2020). pp. 152-165

3.10. Crystal Lee, Tanya Yang, Gabrielle Inchoco, Graham M. Jones, and Arvind Satyanarayan. "Viral Visualizations: How Coronavirus Skeptics Use Orthodox Data Practices to Promote Unorthodox Science Online." In Proceedings of the ACM Conference on Human Factors in Computing Systems (2021). 18pp **

3.11. Harini Suresh, Steven R. Gomez, Kevin K. Nam, and Arvind Satyanarayan. "Beyond Expertise and Roles: A Framework to Characterize the Stakeholders of Interpretable Machine Learning and their Needs." In Proceedings of the ACM Conference on Human Factors in Computing Systems (2021). 16pp **

3.12. Ariel Levy, Monica Agrawal, Arvind Satyanarayan, and David Sontag. "Assessing the Impact of Automated Suggestions on Decision Making: Domain Experts Mediate Model Errors but Take Less Initiative." In Proceedings of the ACM Conference on Human Factors in Computing Systems (2021). 14pp

4. Other Major Publications

4.1. Arvind Satyanarayan, Maxine Lim, Scott R. Klemmer. "A Platform for Large-Scale Machine Learning on Web Design." In Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI) (2012). pp. 1697-1702

** Outgrowth of supervised student research

4.2. Maxine Lim, Ranjitha Kumar, Arvind Satyanarayan, Cesar Torres, Jerry O. Talton, Scott R. Klemmer. "Learning Structural Semantics for the Web." Stanford CSTR 2012-03 (2012).

4.3. Arvind Satyanarayan, Daniel Strazzulla, Clemens Klokmose, Michel Beaudouin-Lafon, Wendy Mackay. In Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI) (2013). 4pp

4.4. James D. Hollan, Arvind Satyanarayan. "Designing Cognitively Convivial Physics for Dynamic Visual Information Substrates." In Rethinking Interaction Workshop of the ACM Conference on Human Factors in Computing Systems (CHI) (2018). 5pp

4.5. Rupayan Neogy, Emily Hu, Arvind Satyanarayan. VisuaLive: Representing Synchronized Visualization Interactions. In Posters of the IEEE Visualization Conference (VIS) (2019). 2pp **

4.6. Amy Rae Fox, Philip Guo, Clemens Nylandsted Klokmose, Peter Dalsgaard, Arvind Satyanarayan, Haijun Xia, and James D. Hollan. "Towards a Dynamic Multiscale Personal Information Space: Beyond Application and Document Centered Views of Information." In Conference Companion of the 4th International Conference on Art, Science, and Engineering of Programming (2020). pp. 136-143

4.7. Nava Haghighi, and Arvind Satyanarayan. "Self-Interfaces: Utilizing Real-Time Biofeedback in the Wild to Elicit Subconscious Behavior Change." In Proceedings of the Fourteenth International Conference on Tangible, Embedded, and Embodied Interaction (2020). pp. 503-509 **

4.8. Angie Boggust, Benjamin Hoover, Arvind Satyanarayan, Hendrik Strobelt. Shared Interest: Human Annotations vs. AI Saliency. In VISxAI Workshop of the IEEE Visualization Conference (VIS) (2020). **

4.9. Nava Haghighi, Nathalie Vladis, Yuanbo Liu, and Arvind Satyanarayan. "The Effectiveness of Haptic Properties Under Cognitive Load: An Exploratory Study." arXiv preprint arXiv:2006.00372 (2020). 10pp **

4.10. Angie Boggust, Brandon Carter, and Arvind Satyanarayan. "Embedding Comparator: Visualizing Differences in Global Structure and Local Neighborhoods via Small Multiples." arXiv preprint arXiv:1912.04853 (2021). 12pp **

4.11. Alan Lundgard and Arvind Satyanarayan. "Accessible Visualization via Natural Language Description: A Four-Level Model of Semantic Content." Under Review at the IEEE Visualization Conference (VIS) (2021). 11pp **

4.12. Angie Boggust, Benjamin Hoover, Arvind Satyanarayan, Hendrik Strobelt. " Shared Interest: Large-Scale Visual Analysis ofModel Behavior by Measuring Human-AI Alignment." Under Review at the IEEE Visualization Conference (VIS) (2021). 11pp **

4.13. Harini Suresh, Kathleen M. Lewis, John V. Guttag, and Arvind Satyanarayan. "Intuitively Assessing ML Model Reliability through Example-Based Explanations and Editing Model Inputs." Under Review at the IEEE Visualization Conference (VIS) (2021). 11pp **

4.14. Yifan Wu, Remco Chang, Joseph M. Hellerstein, Arvind Satyanarayan, and Eugene Wu. " DIEL: Interactive Visualization Beyond the Here and Now." Under Review at the IEEE Visualization Conference (VIS) (2021). 11pp

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** Outgrowth of supervised student research

5. Internal Memoranda and Progress Reports

    None

6. Invited Lectures

    March 2014, "NewsCamp :: Introduction to D3," Computer Aided Reporting (CAR) Conference, Baltimore, MD.

    February 2014, "Lyra: An Interactive Visualization Design Environment," Tapestry, Annapolis, MD.

    March 2014, "Lyra: An Interactive Visualization Design Environment," CAR, Baltimore, MD.

    April 2014, "Lyra: An Interactive Visualization Design Environment," OpenVis Conf, Boston, MA.

    November 2014, "Designing Visualizations with Lyra," HCDE 511: Information Visualization, University of Washington, Seattle, WA.

    2014, "Designing Visualizations with Lyra," J221: Introduction to Data Visualization, University of California at Berkeley Journalism School, Berkeley, CA.

    December 2014, "Designing Visualizations with Lyra," Tata Innovation Labs, Tata Consultancy Services, Delhi, India.

    December 2014, "Lowering the Threshold of Visualization Design," Tata Innovation Labs, Tata Consultancy Services, Delhi, India.

    April 2015, "Lowering the Threshold of Visualization Design," Linfield College, Science Colloquium, McMinnville, OR.

    April 2015, "Designing Visualizations with Lyra Tutorial," I247: Information Visualization & Presentation, University of California at Berkeley Information School, Berkeley, CA.

    September 2015, "Higher-Level Tools for Interactive Data Visualization," BiD Seminar, University of California, Berkeley, CA.

    April 2016, "Reactive Building Blocks: Interactive Visualizations with Vega," OpenVis Conf, Boston, MA.

    May 2016, "Higher-Level Tools for Interactive Data Visualization," INRIA Saclay, Saclay, France.

    July 2016, "Reactive Building Blocks: Interactive Visualizations with Vega," Keynote Talk, DataViz Camp, United Nations.

    October 2016, "The Vega Ecosystem," Keynote Talk, Visualization In Practice Workshop, IEEE VIS, Baltimore, MD.

    February 2017, "Declarative Interaction Design for Data Visualization," University of Illinois Urbana-Champaign, Urbana, IL.

February 2017, "Declarative Interaction Design for Data Visualization," Cornell University, Computer Science & Information Science, Ithaca, NY.

February 2017, "Declarative Interaction Design for Data Visualization," University of Wisconsin-Madison, Madison, WI.

February 2017, "Declarative Interaction Design for Data Visualization," University of California, Berkeley, CA.

March 2017, "Declarative Interaction Design for Data Visualization," University of Michigan, Ann Arbor, MI.

March 2017, "Declarative Interaction Design for Data Visualization," University of Toronto, Toronto, Canada.

March 2017, "Declarative Interaction Design for Data Visualization," University of British Columbia, Vancouver, Canada.

April 2017, "Declarative Interaction Design for Data Visualization," Northwestern University, Evanston, IL.

April 2017, "Declarative Interaction Design for Data Visualization," University of California, San Diego, CA.

April 2017, "Declarative Interaction Design for Data Visualization," New York University, Tandon Computer Science & Center of Data Science, New York City, NY.

April 2017, "Vega-Lite: A Grammar of Interactive Graphics," OpenVis Conference, Boston, MA.

May 2018, "The Building Blocks of Interpretability," emlyon business school, Lyon, France.

September 2018, "Visualization: A Petri Dish for Intelligence Augmentation," Northeastern University, Boston, MA.

April 2019, "Visualization: A Petri Dish for Intelligence Augmentation," Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA.

June 2020, "Towards Effective Interaction with Data Visualization," Invited Talk, Symposium on Data Science & Statistics, American Statistics Association.

June 2020, "Towards Effective Interaction with Data Visualization," Keynote Talk at the ACM SIGMOD Workshop on Human-In-the-Loop Data Analytics.

Theses Supervised by Arvind Satyanarayan

	Total	Completed	In Progress
Bachelor's	0	0	0
Master's	2	2	0
MEng	4	4	0
Engineer's	0	0	0
Doctoral			
As Supervisor	6	0	6
As Reader	6	4	2

Bachelor's Theses

None

Master's Theses

Zong, Jonathan, "Designing Interactive Visualizations by Demonstration," February 2020.

Lundgard, Alan, "Measuring Justice in Machine Learning," September 2020.

MEng Theses

Kherraz, Houssam, "Leveraging Dataset Examples for the Interpretation of Back-Box Deep Learning Models," May 2020.

Neogy, Rupayan, "Synchronized Vega-Lite: Designing Collaborative Visualization," May 2020.

Bacher, Katharine, "Direct Manipulation Techniques for Creation of Multiple-View Visualizations," May 2021.

Sefah, Ebenezer, "Interactive History Support for the Exploratory Design of Data Visualizations," May 2021.

Engineers Theses

None

Doctoral Theses, Supervisor

Lee, Crystal, expected 2022.

Suresh, Harini, expected 2022.

Hopkins, Aspen, expected 2023.

Lundgard, Alan, expected 2023.

Zong, Jonathan, expected 2023.

Boggust, Angie, expected 2025.

Doctoral Theses, Reader

Zhang, Amy X., "Systems for Collections Human Curation of Online Discussion," August 2019.

Theses Supervised by Arvind Satyanarayan

Ortiz-Lampier, Pablo J., "Deeper Learning at Scale with Roleplaying Systems," October 2020.

Olson, Danielle M., "Social Modeling in Computational Simulations: Racial and Ethnic Representation in Videogames and Virtual Reality Systems," May 2021.

Tao, Wenbo, "Democratizing Details-on-Demand Data Visualizations at Scale," May 2021.

Chan, Gromit Y., "Data Summaries for Scalable Visual Analysis," expected September 2021 (New York University, Computer Science).

Fox, Amy R., expected June 2022 (UC San Diego, Cognitive Science).

Postdoctoral Associates and Fellows Supervised by Arvind Satyanarayan

<u>Current Postdocs</u>

Name	Dates of Appointment	PhD Granting Institution
None		

<u>Previous Postdocs</u>

Name	Current Title	Current Employer
None		

Teaching Evaluations of Arvind Satyanarayan

Term	Course Number	Course Title	Role	Course Type	# Students Registered	# Survey Responses	Instructor's Evaluation	Course Evaluation	Scale
Winter 2016	HCID 520	User Interface Software & Technology (University of Washington)	Lecturer	Lecture	36	16	4.1	4.1	0=lowest; 5=highest
FT18	6.170	Software Studio	Lecturer	Lecture	56	23	6.4	6.2	1=Very Poor, 7=Excellent
ST19	6.894	Interactive Data Visualization	Lecturer	Lecture	50	22	6.9	6.7	1=Very Poor, 7=Excellent
FT19	6.170	Software Studio	Lecturer	Lecture	64	27	6.6	6.4	1=Very Poor, 7=Excellent
ST20	6.894	Interactive Data Visualization	Lecturer	Lecture	86	*	*	*	1=Very Poor, 7=Excellent
FT20	6.170	Software Studio	Lecturer	Lecture	98	*	*	*	1=Very Poor, 7=Excellent
ST21	6.859	Interactive Data Visualization	Lecturer	Lecture	128	*	*	*	1=Very Poor, 7=Excellent

*Omitted due to COVID-19.

Photograph of Arvind Satyanarayan

Arvind Satyanarayan