Scholarly Activities Statement

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1 Summary

1.1 Expectation for Promotion

The School of Informatics, Computing, and Cyber Systems (SICCS) Conditions of Faculty Service (COFS) documentation, found in Appendix E, states that the following criteria are to be met for promotion to Associate Professor with Tenure in relation to scholarly activities (labels and emphases added are my own to aid analysis). Note that, for promotion and tenure, the SICCS COFS requires a **sustained pattern of achievement** in criteria (I) to (IV), while criterion (V) indicates a **strong pattern of accomplishments**.

> *"In scholarly activities, faculty must demonstrate a sustained pattern of achievement in (I) scholarly dissemination and (II) external grants, an (III) upward trajectory of success and leadership in these efforts, and (IV) national visibility as a scholar in the field, as appropriate to workload allocation. A (V) strong pattern of accomplishments for faculty applying for promotion and tenure consists of both scholarly products and funding support that, over a five year average and not including unawarded grant proposals and internal grants, achieves the criteria described in Table 1."*

Table 1 in the SICCS COFS, reproduced in Table 1 below, provides explicit guidelines for the minimum criteria for scholarly activities, in terms of the number of "scholarly products" expected based on the scholarly activity workload allocation. Scholarly products, or products for short, refer to publications (one item per a published or submitted scholarly work), grant proposals (one item per a funded or submitted proposal), and active funding (one item per $75K). More details can be found in Sections 3.2.1 and 3.2.2 of the SICCS COFS. Table 2 summarizes my scholarly activity workload

Table 1: *Table 1 in the SICCS COFS specifies the minimum criteria in terms of scholarly products.*

Scholarly Allocation	Minimum Criteria for Scholarly Activities
<= 15%	One item, proportional to the scholarly workload allocation
16%-40%	Criteria for 15% allocation, plus one item proportional to the difference between the scholarly workload allocation and 15%, at the rate of 10% for each item
>= 41%	Criteria for 40% allocation, plus one item proportional to the difference between the scholarly workload allocation and 40%, at the rate of 8% for each item

Table 2: *Scholarly activity workload allocation and the corresponding minimum number of products.*

Academic Year	Scholarly Allocation (%)	Min. Products Required
2017–2018 (half-year)	85	9.1 (half-year: 4.5)
2018–2019	75	7.9
2019–2020	67.5	7.0
2020–2021	63	6.4
2021–2022	65	6.6
2022–2023	45	4.1

allocation and the corresponding minimum numbers of scholarly products to meet the expectation. Note that because I joined NAU in January 2018, I was at NAU in only the second half of the AY 2017–2018, therefore my scholarly expectation in that AY was half of the full-year expectation.

Based on these criteria, in this statement, I summarize my accomplishments in scholarly dissemination, externally funded grants, and national visibility as a research scholar.

1.2 Summary of Accomplishments

Since I joined NAU as an assistant professor in 2018, I have built an active research program, including publications and extramural funding to support my research. Table 3 maps evidence presented in this document to the criteria outlined in the SICCS COFS statement for promotion and tenure (as discussed in Section 1.1). The table is divided into two main sections: required criteria (as stated in the SICCS COFS) and my additional accomplishments, which are not required by the SICCS COFS but highlight how I have exceeded the expectation. I highlight a notable accomplishment that **I am a recipient of the NSF CAREER award and the NSF Engineering Research Initiation (ERI) award**.

Table 3: *Summary of scholarly activity accomplishments and supporting evidence mapped to the criteria in the SICCS COFS.*

Accomplishment	Supporting Evidence
Required Criteria Stated in the SICCS COFS (Section 1.1)	
(I) Dissemination	As an assistant professor at NAU, I have published 29 peer-reviewed papers (6 journal articles and 23 refereed conference/workshop papers), with 4 additional journal articles currently under review. I am the lead author or one of the lead authors on roughly 39% of the papers, my students are co-authors on about 33% of the papers (21% as lead authors), and I am a senior/supervising author on about 30% of the papers. Overall, I have a significant role and effort on roughly 64% of the papers. I have published in highly reputable journals and conferences (see Table 7). See more details in Section 2.
(II) Funding	I have obtained a total of $11.05M in grants ($10.95M in extramural grants) with $2.57M under my management ($2.55M in extramural grants), across federal funding agencies (NSF, ARL), industry, and professional organizations. My funding has come from 10 extramural grants and 5 internal grants, including prestigious **NSF CAREER** award and **NSF ERI** award (see Table 8). On average, I have submitted about 6.6 funding proposals per year in the last five years. Out of 39 proposals that I have submitted since joining NAU, 2 are currently pending and 14 were funded (success rate: $14/37 = 37.8\%$). Out of

	14 NSF proposals that I have submitted, 2 are currently pending and 4 were funded (success rate: $4/12 = 33.3\%$). See Section 3 for more details.
(III) Upward trajectory	I have had a strong and steady growth in my scholarly products year over year, except for a slight dip in AY 2020–2021 due to the COVID-19 pandemic, despite my decreasing workload allocation; see Figure 1. As shown in Table 5, my accomplishments in terms of submitted and published papers, submitted grant proposals, and active funding have increased substantially in the last two years (AY 2021–2022 and AY 2022–2023), particularly my funding and publications. I especially highlight my recent success in grant funding (an NSF EPCN grant, an NSF CAREER award, a $8.4M ARL grant, and an industry grant in AY 2022–2023, an NSF ERI award, a $1.37M NSF grant, and two industry grants in AY 2021–2022), as well as in publications (3 journal articles and 9 conference papers published in AY 2022–2023). I have shown a strong upward trajectory of not only scholarly productivity but also, and more importantly, scholarly success in all areas. See Section 1.3 for more details.
(IV) National visibility	I have gained national and international visibility through proposal review panels (4 NSF panels), membership on technical program committees, organizing and chairing technical sessions at premier international conferences, reviewing articles for top-tier journals and conferences, and invited talks at institutions in the United States and Canada (5 times). See more details in Section 4.
Additional Accomplishments	
(V) Five-year average accomplishments	Table 5 shows my five-year average accomplishments in all areas, where, on average, I have submitted 10 papers/year, published 5.2 papers/year, submitted 6.6 grant proposals/year, and managed directly $120.5K/year of active funding ($116.8K/year of active extramural funding). In total, I have produced an average of 18.21 scholarly products/year, substantially exceeding the averaged expectation of 6.4 scholarly products/year. Excluding unpublished papers, unawarded grant proposals, and internal grants, I have achieved on average 9.36 products/year, well above the averaged expectation of 6.4 products/year. See Section 1.3 for more details.
Impact	I have received a Best Paper Award at a premier international conference and a Best Presentation Award with my students. In the last five years, my number of citations has increased from 491 to 1278 with the h-index rising from 11 to 18. See more details in Section 2.4.

1.3 Annual Evaluations and Scholarly Products

Table 4 summarizes my scholarly activities ratings by the SICCS Annual Review Committee (ARC) and the SICCS Director's evaluation, where possible ratings are as follows: unsatisfactory, satisfactory (for meeting expectations), meritorious (for *exceeding expectations*), and highly meritorious (for *substantially exceeding expectation*). I have always received the *meritorious* or *highly meritorious* ratings, by exceeding or substantially exceeding the expectations, in the scholarly activities category every year. The average ratings for my scholarly activities over my pre-tenure years are both *highly meritorious*, showing that I have substantially exceeded expectations in this activities category. I also want to point out the upward trajectories of my ratings in this category. The full annual reviews by the ARC and the SICCS director are included in Appendix A.

Table 4: *Annual evaluation ratings for my scholarly activities.*

Academic Year	ARC Evaluation	Director's Evaluation
2017–2018 (half-year)	Highly Meritorious	Highly Meritorious
2018–2019	Meritorious	Meritorious
2019–2020	Highly Meritorious	Meritorious
2020–2021	Highly Meritorious	Highly Meritorious
2021–2022	Highly Meritorious	Highly Meritorious
2022–2023	Highly Meritorious	Highly Meritorious
Average	Highly Meritorious	Highly Meritorious

Table 5: *Total scholarly products based on the SICCS COFS, including publications (both submitted and published), grant proposal submissions, and active funding (where $75K in active funding is equal to one product). Two data points are reported for each year's active funding: all funding and only extramural funding. Excluded from the table are small awards; however, I will highlight all of my awards in Section 3. The minimum number of products required for each year is listed for comparison with the total number of products. The averages for the last five years since AY 2018–2019 (excluding the first semester of Spring 2018) are reported in the last row.*

Academic Year	Papers		Grant Proposals	Active Funding (Products)		Min. Products Required	Total Products
	All	Published		All	External		
2017–2018 (half-year)	3	2	5	$0K (0)	$0K (0)	4.5	8.00
2018–2019	6	4	5	$30K (0.4)	$30K (0.4)	7.9	11.4
2019–2020	10	4	5	$13.4K (0.18)	$11K (0.15)	7	15.18
2020–2021	7	4	6	$22K (0.29)	$11K (0.15)	6.4	13.29
2021–2022	9	3	11	$135K (1.8)	$130K (1.73)	6.6	21.8
2022–2023	18	11	6	$402K (5.36)	$402K (5.36)	4.1	29.36
Average (2018-now)	10	5.2	6.6	$120.5K (1.61)	$116.8K (1.56)	6.4	18.21

Table 5 summarizes the main scholarly products that I generated each year in different categories: publications, grant proposal submissions, and active funding. The "Papers/All" column includes both submitted papers (whether accepted or rejected) and published papers, while the "Papers/Published" column includes only published papers. In active funding, the column "All" includes both internal and extramural funding, while the "External" column includes only extramural funding. Here, according to the SICCS COFS, each $75K in active funding is equal to one product. Table 5 excludes other products that count for fractional credit, such as posters, non-peer reviewed publications (e.g., white-papers and pre-prints), and software contributions, among other research artifacts.

The last two columns of Table 5 list, for each AY, the minimum number of scholarly products corresponding to my workload allocation (see Table 2) and the total number of products. They clearly show that my scholarly products always exceeded or substantially exceeded expectations. This is also evident in the last row of Table 5, which shows the annual averages over the last five years since AY 2018–2019 (excluding the first semester of Spring 2018 when I joined NAU). I have produced an average of 18.21 products/year, substantially exceeding the averaged expectation of 6.4 products/year. For promotion to Associate Professor with Tenure, the SICCS COFS states that "*…over a five year*

average and not including unawarded grant proposals and internal grants, achieves the criteria described in Table 1." Even if I were to include only published papers, active extramural funding, and awarded grant proposals (a total of 13 for an annual average of 2.6 awarded proposals in the last five years), my average would be 9.36 products/year, well above the averaged expectation of 6.4 products/year.

Finally, Figure 1 depicts the trajectory of my total scholarly products over time (blue line), compared with the minimum expectations corresponding to my workload (red bars). The plot shows that my scholarly productivity not only exceeded the expectations every single year but also has been increasing over the years (upward trajectory), except for a slight dip in AY 2020–2021 due to the COVID-19 pandemic.

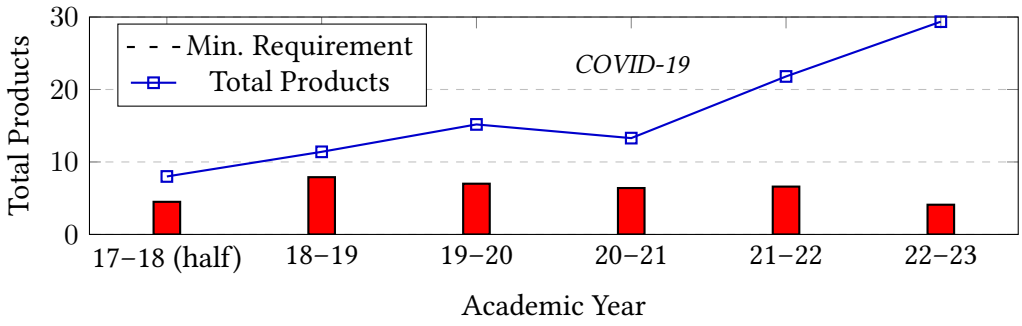

Figure 1: *Trajectory of scholarly products over time, in comparison with minimum expectations.*

2 Scholarly Dissemination

2.1 Conventions in my Field

Author order: In my field, the first author is typically, though not always, the lead author who was primarily responsible for manuscript development, and had the largest work effort in the research / project development. The last author is often the most senior author, the group leader, or the PI who supervised or led the research work / project that resulted in the manuscript. Consequently,

- *If I am listed as the first author or lead author*, then I was primarily responsible for conceiving the paper and research, and I wrote the paper with input (often minor) from my co-authors.
- *If I am listed as the last or senior author*, then I typically played a significant role in the conception of the paper and research, supervising or leading the research study and paper development, and editing the manuscript (as would be typical if one of my advisees was the lead author).
- *If I am listed as an intermediate author*, I typically helped to conceive/lead/supervise the research, wrote parts of the manuscript, and/or performed substantial edits.

Publication venues: In my field, we have peer-reviewed conferences and workshops, some of which are highly selective and considered more prestigious than some of our highly ranked journals. In these top-tier conferences and workshops, each submission is typically reviewed by 3 to 5 reviewers. Thus, publications in such venues should be considered equivalent to a peer-reviewed journal article in the domain sciences.

2.2 Publications as Assistant Professor

A list of papers since I joined NAU is found below. The list also includes some papers that are under review at the time of this writing. Table 6 summarizes the numbers of my publications in different

categories, and Table 5 on page 4 shows the numbers of my papers in each academic year, since arriving at NAU. A complete list of all the publications in my academic career can be found in my CV in Appendix F.

Table 6: *Numbers of my publications in different categories since joining NAU in 2018.*

	Published	Under review	*Total*
Refereed Journal Publications	6	4	*10*
Refereed Conference & Workshop Publications	23	0	*23*
Total	*29*	*4*	*33*

The author names in the list below are marked for their roles, using the following convention:

- My name is in **bold typeface**.
- The lead/first author name is marked with a * symbol; if there are multiple lead authors with equal contributions or efforts, their names are each marked with the * symbol.
- The names of my students are underlined.
- The senior/supervising author name is marked with a $^\$$ symbol.

I highlight the following observations:

- I am the **lead author or one of the lead authors** on 13/33 papers (39.4%).
- Graduate and undergraduate students that I mentored or co-mentored are authors on 11/33 papers (33.3%), where my direct student mentees, for whom I am the research advisor, have lead authorship roles on 7 of those papers (21.2%).
- I am the **senior/supervising author** on 10/33 papers (30.3%).
- I had a **significant role and effort** (I was a lead author, or my students co-authored, or I was a senior/supervising author) on 21/33 papers (63.6%).

Under-review Journal Papers

[1] B. Nguyen*, H. Nguyen, **T. X. Nghiem**, L. Nguyen, and T. Nguyen, "On Encrypted Consensus Protocol for Distributed Multi-Agent Systems," *Under review (minor revision) at IEEE Transactions on Industrial Informatics*, 2023.

[2] A. Duarte*, **T. X. Nghiem**, and S. Wei, "Optimal Querying for Communication-efficient ADMM using Gaussian Process Regression," *Under review (minor revision) at Franklin Open*, 2023.

[3] L. Nguyen*, D. K. Nguyen, **T. X. Nghiem**, and T. Nguyen, "Convolutional neural network regression for low-cost microalgal density estimation," *Under review at IEEE Sensors Journal*, 2023.

[4] A. Duarte*, **T. X. Nghiem**, and S. Wei, "Communication-efficient ADMM using quantization-aware Gaussian process regression," *Under review (minor revision) at EURO Journal on Computational Optimization*, 2023.

Journal Publications

[5] B. Nguyen*, **T. X. Nghiem**, L. Nguyen, H. M. La, and T. Nguyen, "Connectivity-preserving distributed informative path planning for mobile robot networks," *IEEE Robotics and Automation Letters*, vol. 9, pp. 2949–2956, Mar. 2024.

[6] L. Nguyen*, D. K. Nguyen, T. Nguyen, B. Nguyen, and **T. X. Nghiem**$, "Analysis of Microalgal Density Estimation by Using LASSO and Image Texture Features," *Sensors*, vol. 23, p. 2543, Jan. 2023.

[7] V.-A. Le*, L. Nguyen, and **T. X. Nghiem**$, "Multi-Step Predictions for Adaptive Sampling in Mobile Robotic Sensor Networks using Proximal ADMM," *IEEE Access*, vol. 10, pp. 64850–64861, 2022.

[8] L. Nguyen*, D. K. Nguyen, **T. X. Nghiem***, and T. Nguyen, "Least square and Gaussian process for image based microalgal density estimation," *Computers and Electronics in Agriculture*, vol. 193, p. 106678, Feb. 2022.

[9] V.-A. Le*, L. Nguyen, and **T. X. Nghiem**$, "ADMM-based Adaptive Sampling Strategy for Nonholonomic Mobile Robotic Sensor Networks," *IEEE Sensors Journal*, 2021.

[10] Y. V. Pant*, H. Abbas, K. Mohta, R. A. Quaye, **T. X. Nghiem**, J. Devietti, and R. Mangharam$, "Anytime Computation and Control for Autonomous Systems," *IEEE Transactions on Control Systems Technology*, pp. 1–12, 2020.

Refereed Conference and Workshop Publications

[11] **T. X. Nghiem***$, T. Nguyen, B. Nguyen, and L. Nguyen, "Causal Deep Operator Networks for Data-Driven Modeling of Dynamical Systems," in *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, IEEE, 2023.

[12] R. Tumu*, L. Lindemann, **T. X. Nghiem**, and R. Mangharam$, "Physics Constrained Motion Prediction with Uncertainty Quantification," in *IEEE Intelligent Vehicles Symposium (IV)*, 2023.

[13] B. Nguyen*, **T. X. Nghiem***, L. Nguyen, A. T. Nguyen, and T. Nguyen$, "Real-time distributed trajectory planning for mobile robots," in *IFAC World Congress*, 2023.

[14] T. Nagy*, A. Amine*, **T. X. Nghiem**, Ugo Rosolia, Zirui Zang, and Rahul Mangharam$, "Ensemble Gaussian Processes for Adaptive Autonomous Driving on Multi-friction Surfaces," in *IFAC World Congress*, 2023.

[15] **T. X. Nghiem***, J. Drgona*, C. Jones, Z. Nagy, R. Schwan, B. Dey, A. Chakrabarty, S. D. Cairano, J. A. Paulson, A. Carron, M. N. Zeilinger, W. S. Cortez, and D. L. Vrabie, "Physics-informed machine learning for modeling and control of dynamical systems," in *American Control Conference (ACC)*, pp. 3735–3750, 2023.

[16] B. Nguyen*, **T. X. Nghiem***, L. Nguyen, A. T. Nguyen, T. Nguyen, and M. Sookhak, "Distributed formation trajectory planning for multi-vehicle systems," in *American Control Conference (ACC)*, pp. 1325–1330, 2023.

[17] B. T. Nguyen*, **T. X. Nghiem**, L. Nguyen, T. T. Nguyen, and T. Nguyen, "Secure- and Privacy-Preserving Policies for Distributed Cooperative Control of Multiple Vehicle Systems," in *SPIE Defense + Commercial Sensing (DCS23)*, International Society for Optics and Photonics (SPIE), Apr. 2023.

[18] T. T. Nguyen* and **T. X. Nghiem**, "Post-Quantum Cryptography-Based Highly Secure Communication for Multi-Robot Systems," in *SPIE Defense + Commercial Sensing (DCS23)*, International Society for Optics and Photonics (SPIE), Apr. 2023.

[19] T. T. Nguyen*, C. R. daCunha, **T. X. Nghiem**, and B. Cambou, "A Video Surveillance-Based Face Image Security System using Post-Quantum Cryptography," in *SPIE Defense + Commercial Sensing (DCS23)*, International Society for Optics and Photonics (SPIE), Apr. 2023.

[20] T. B. Nguyen*, T. Nguyen, **T. X. Nghiem**, L. Nguyen, J. Baca, P. Rangel, and H.-K. Song, "Collision-free Minimum-time Trajectory Planning for Multiple Vehicles based on ADMM," in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 13785–13790, 2022.

[21] V.-A. Le* and **T. X. Nghiem**$, "Distributed Experiment Design and Control for Multi-agent Systems with Gaussian Processes," in *IEEE Conference on Decision and Control (CDC) 2021*, 2021.

[22] V.-A. Le*, L. Nguyen, and **T. X. Nghiem**$, "An efficient adaptive sampling approach for mobile robotic sensor networks using proximal ADMM," in *American Control Conference (ACC)*, 2021.

[23] V.-A. Le* and **T. X. Nghiem**$, "A Receding Horizon Approach for Simultaneous Active Learning and Control using Gaussian Processes," in *IEEE Conference on Control Technology and Applications (CCTA 2021)*, 2021.

[24] **T. X. Nghiem***, A. Duarte, and S. Wei, "Learning-based Adaptive Quantization for Communication-efficient Distributed Optimization with ADMM," in *Asilomar Conference on Signals, Systems, and Computers*, 2020.

[25] V.-A. Le* and **T. X. Nghiem**$, "Gaussian process based distributed model predictive control for multi-agent systems using sequential convex programming and ADMM," in *IEEE Conference on Control Technology and Applications (CCTA 2020)*, 2020.

[26] **T. X. Nghiem***$, T.-D. Nguyen, and V.-A. Le, "Fast Gaussian Process based Model Predictive Control with Uncertainty Propagation," in *Annual Allerton Conference on Communication, Control, and Computing*, (Illinois, USA), pp. 1052–1059, Sept. 2019.

[27] D. Nguyen*, Z. Yang, and **T. X. Nghiem**$, "Data-driven Energy Demand Prediction and Analysis of Buildings," in *Annual Student Conference on Renewable Energy Science, Technology, and Policy at the Energy-Water-Food Nexus (AZSEC) 2019*, Nov. 2019. **BEST PRESENTATION AWARD**.

[28] **T. X. Nghiem***$, "Linearized Gaussian Processes for Fast Data-driven Model Predictive Control," in *2019 American Control Conference (ACC)*, (Philadelphia, PA, USA), pp. 1629–1634, IEEE, July 2019.

[29] V. Yaramasu*, **T. X. Nghiem***, Kristiyan Milev*, Leah Wellman, Alana Keith, Hao Du, Hasan Alsinafi, and J. Cordana, "Impacts of Zero Net Energy Homes on Distribution Grids," in *Intelligent Building Operations Workshop*, (Boulder, CO), Aug. 2019.

[30] A. Jain*, **T. X. Nghiem***, M. Morari, and R. Mangharam$, "Learning and Control using Gaussian Processes: Towards bridging machine learning and controls for physical systems," in *International Conference on Cyber-Physical Systems (ICCPS)*, (Porto, Portugal), Apr. 2018. **BEST PAPER AWARD**.

[31] **T. X. Nghiem***, G. Stathopoulos, and C. Jones$, "Learning Proximal Operators with Gaussian Processes," in *Annual Allerton Conference on Communication, Control, and Computing*, (Illinois, USA), Oct. 2018.

[32] A. Jain*, D. Nong*, **T. Nghiem***, and R. Mangharam$, "Digital Twins for Efficient Modeling and Control of Buildings: An Integrated Solution with SCADA Systems," in *2018 Building Performance Analysis Conference and SimBuild*, Sept. 2018.

[33] D. Nong*, A. Jain*, **T. Nghiem***, and R. Mangharam$, "An integrated solution for whole building model predictive control," in *2018 Building Performance Analysis Conference and SimBuild*, 2018.

2.3 Quality/Significance of Publication Venues

The SICCS COFS does not consider the impact of publications for promotion to associate professor with tenure (while demonstrated impact is explicitly required for promotion to full professor). However, I will present several metrics that demonstrate that many of my papers were published in highly regarded venues in my fields of study, providing broad opportunities for impact and visibility as a scholar. The metrics I use are from Google Scholar Metrics[1], which provides the h5-index and h5-median scores[2], where the higher the values are the higher the venue is ranked.

Table 7 (page 10) shows the various metrics of some journals, conferences, and workshops where I have published. For context, the h5-index and h5-median scores of the top venue in several subfields of Engineering & Computer Science that are relevant to my research are listed below:

- Automation & Control Theory: top venue has h5-index of 115 and h5-median of 166.
- Robotics: top venue has h5-index of 116 and h5-median of 188.
- General Engineering & Computer Science: top venue has h5-index of 200 and h5-median of 303.

In summary, I believe that many of my contributions have been published in very reputable journals and conferences, and I will continue to aim to publish in top-tier venues.

2.4 Impact

Although **the SICCS COFS does not consider the impact of publications for promotion to associate professor with tenure**, I highlight in this subsection some impact of my scholarly works in various aspects.

Awards: My students and I have received several awards recognizing the quality of our research.

- In 2018, my paper [30] (or [C18] in my CV) received the **Best Paper Award** at the 2018 International Conference on Cyber-Physical Systems (ICCPS), which is a premier venue for the research community in cyber-physical systems. According to Google Scholar, the paper has since been cited 93 times, averaging between 17 to 20 citations a year in the last 3 years.
- In 2019, my students and I received the **Best Presentation Award** at the Annual Student Conference on Renewable Energy Science, Technology, and Policy at the Energy-Water-Food Nexus (AZSEC), for our work [27] (or [W2] in my CV).

Citations: When I joined NAU in January 2018, my publications on Google Scholar had 491 citations with an h-index of 11. At the time of this writing, my Google Scholar profile recorded 1278 citations (an increase of 787 or 160%) with an h-index of 18 (an increase of 7 or 64%). Though citations are a common proxy for impact in the research community, the **SICCS COFS does not set any criterion for citations impact of publications for promotion to associate professor with tenure**.

[1] `https://scholar.google.com/citations?view_op=top_venues&hl=en`.
[2] `https://scholar.google.com/intl/en/scholar/metrics.html`

Table 7: *Metrics of some journals, conferences, and workshops where I have published.*

Venue	h5-index	h5-median	Note
Journals			
IEEE Robotics and Automation Letters (2022 IF=5.2)	106	145	#2 in all Robotics journals and conferences (Google Scholar Metrics)
IEEE Access (2022 IF=3.9)	200	303	#1 in General Engineering & Computer Science (Google Scholar Metrics)
Sensors (2022 IF=3.9)	145	201	
Computers and Electronics in Agriculture (2022 IF=8.3)	91	141	#1 in Agronomy & Crop Science (Google Scholar Metrics)
IEEE Sensors Journal (2022 IF=4.3)	84	106	
IEEE Transactions on Control Systems Technology (2022 IF=4.8)	72	100	#5 in Automation & Control Theory (Google Scholar Metrics)
Conferences and Workshops			
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	80	116	#4 in all Robotics journals and conferences (Google Scholar Metrics)
IEEE Intelligent Vehicles Symposium	59	97	
IEEE Conference on Decision and Control (CDC)	44	61	#1 Conference in Automation & Control Theory (Google Scholar Metrics)
American Control Conference (ACC)	43	59	#2 Conference in Automation & Control Theory (Google Scholar Metrics)
IEEE International Conference on Systems, Man and Cybernetics (SMC)	31	49	
IFAC World Congress	52	69	
IEEE Conference on Control Technology and Applications (CCTA)	23	30	

3 Funding

I have been active in pursuing extramural funding. My CV in Appendix F lists all the grants I have received and my currently pending proposals. Table 8 shows my detailed record of obtaining funding for two categories: where I am PI/co-PI on externally funded grants, and internal grants and small awards. It also includes, for each grant, the total amount and the amount under my management (which is a portion of the total amount in the case where I am co-PI or the grant is divided between multiple institutions).

I have been funded by four NSF awards, one Army Research Laboratory (ARL) award, four industry grants, and one professional organization grant. I highlight that I am the recipient of the **prestigious NSF CAREER award** and the **NSF Engineering Research Initiation (ERI) award**. Since joining NAU in 2018, I have secured about **$11.05M** total in grants, with about **$2.57M under my management**. Of these funding amounts, a total of **$10.95M** with **$2.55M under my management** are from **extramural grants**. I believe that this is exceptional given my career stage. I elaborated on how these projects and my currently pending proposals support and fit into my overall research agenda in my Research Statement.

The internal and small awards have very high utility, and I am grateful to the sponsors for their support. The seed funding from NAU and the Arizona Board of Regents (ABOR) helped me develop my research and obtain preliminary results, which ultimately led to my NSF ERI and NSF CAREER awards. The funding from the Institute of Electrical and Electronics Engineers (IEEE) allowed me to acquire several small-scale autonomous race cars F1/10, which have been very helpful for both my research and student-related activities (including new course development, Capstone senior design projects, and student research, which are described in my Student-Related Activities Statement).

Table 8: *Awarded grants with the total amount and the amount under my management.*

Description of Awarded Grants	Amount Total	Amount Under My Mgmt
PI/co-PI on Externally Funded Grants		
Title: Collaborative Research: An Integrated Framework for Learning-Enabled and Communication-Aware Hierarchical Distributed Optimization **Sponsor:** NSF **Role:** Lead PI **Period:** 7/2024 – 6/2027	$249,999	$249,999
Title: Modeling and Prediction of Impact of Commercial Electric Vehicle Charging on SRP Grid **Sponsor:** Salt River Project (SRP) utility company **Role:** PI; Co-PI: Yaramasu **Period:** 7/2023 – 7/2024	$64,427	$64,427
Title: CAREER: Composite Physics-Informed Learning of Dynamic Systems **Sponsor:** NSF, Faculty Early Career Development Program (CAREER) **Role:** Sole PI **Period:** 7/2023 – 6/2028	$492,470	$492,470
Title: Cognitive Distributed Sensing in Congested Radio Frequency Environments **Sponsor:** DEVCOM Army Research Laboratory (ARL) **Role:** Co-PI; PI: Cambou **Period:** 3/2023 – 2/2027	$8.4M	$1.1M
Title: ERI: Towards Data-driven Learning and Control of Building HVAC Systems **Sponsor:** NSF, Engineering Research Initiation (ERI) **Role:** Sole PI **Period:** 3/2022 – 2/2024	$199,530	$199,530
Title: DISCOVER Distributed Sensing & Computing Over Sparse Environments Platform **Sponsor:** NSF **Role:** Co-PI; Collaborative project with Navajo Tech Univ. and Clemson Univ. **Period:** 10/2021 – 9/2024	$1.37M	$300K
Title: Data Acquisition, Modeling, and Prediction of Charging Load Profiles of Commercial Electric Vehicles in SRP's Service Territory **Sponsor:** Salt River Project (SRP) utility company **Role:** PI; Co-PI: Yaramasu **Period:** 7/2022 – 7/2023	$67,197	$67,197
Title: Trends and Impact of Public and Workplace Charging Infrastructure in SRP Territory **Sponsor:** Salt River Project (SRP) utility company **Role:** Co-PI; PI: Yaramasu **Period:** 7/2022 – 7/2023	$69,600	$69,600

Title: FF1RR: Flagstaff's F1/10 Robo-Racing **Sponsor:** Institute of Electrical and Electronics Engineers (IEEE) **Role:** PI **Period:** 9/2019 – 7/2021 **Note:** $14,977 from IEEE and $7,000 match from NAU	$14,977	$14,977
Title: Analysis on Impacts of Zero Net Energy Homes and Electric Vehicles on Distribution Grids **Sponsor:** Salt River Project (SRP) utility company **Role:** Co-PI; PI: Yaramasu **Period:** 8/2018 – 5/2019	$60,369	$60,369
Internal Grants and Small Awards		
Title: Software for Physics-Informed Machine Learning of Complex Systems **Sponsor:** NAU / Arizona's Technology Research Initiative Fund **Role:** PI **Period:** 11/2023 – 8/2024	$5,000	$5,000
Title: Occupancy-based HVAC Controls for Energy Savings in Academic Buildings **Sponsor:** NAU / Arizona's Technology Research Initiative Fund **Role:** PI **Period:** 2 – 6/2022	$5,000	$5,000
Title: Data Acquisition, Control and Charging of Drones **Sponsor:** NAU Small Research Equipment Acquisition Program (S-REAP) **Role:** Co-PI **Period:** 10/2020 – 6/2021	$25,000	$6,250
Title: Estimating occupancy density and ventilation quality for indoor health and safety during a pandemic **Sponsor:** NAU / Arizona's Technology Research Initiative Fund **Role:** PI **Period:** 10/2020 – 6/2021	$5,000	$5,000
Title: Data-driven Analytics of Building Utility Demand **Sponsor:** NAU Green Fund **Role:** PI **Period:** 6 – 7/2020	$2,419	$2,419
Total Funding:	**$11.05M**	
Total Funding Under My Management:		**$2.57M**

In addition to the funded proposals, I list in Table 9 my proposals that are currently pending at the time of this writing and in Table 10 those proposals that were unfunded since I joined NAU (excluding small grant proposals of less than $10K, white papers, and letters of intent). I report these unfunded proposals because even if a proposal is declined funding, it requires significant effort, and while these products are not considered for tenure, they accounted for a significant portion of my workload.

Overall, I have submitted 39 proposals since I joined NAU, of which 2 are currently pending and 14 were funded (success rate: $14/37 = 37.8\%$). I have submitted 14 proposals to the NSF, of which 2 are currently pending and 4 were funded (success rate: $4/12 = 33.3\%$).

4 National Visibility

The SICCS COFS states "*…national visibility as a scholar in the field…*" as a criterion for promotion to associate professor with tenure. In this section, I describe activities that capture both national and international visibility since I joined NAU in 2018; a complete list of activities during my career

Table 9: *Grant proposals that are currently pending at the time of this writing.*

Description of Pending Grant Proposal	Role	Amount
Title: Autonomous Scaleable UAV Exploration of Forest Carbon Dynamics, and Fire and Timber Management: The Clearwing Project **Sponsor:** USDA **Duration:** 2 years PI: Alexander Shenkin (NAU)	Co-PI	$299,937
Title: Combining Formal, Static, and Dynamic Analysis to Verify and Validate Real-World Embedded Systems **Sponsor:** NSF **Duration:** 3 years PI: Alex Groce (NAU)	Co-PI	$513,829

can be found in my CV in Appendix F. Note that many of my professional activities are related to international conferences, and thus are not limited to national activities[3]. Several of these activities are reiterated in my Service Activities Statement, where I discuss my professional service activities.

4.1 Journal, Conference, and Grant Proposal Review Activities

I have been a **reviewer for several journals** in my field and adjacent fields, as follows:

- IEEE Transactions on Automatic Control
- IEEE Transactions on Control Systems Technology
- IEEE Signal Processing Letters
- Robotica (Cambridge)
- Systems & Control Letters (Elsevier)
- Applied Energy (Elsevier)
- Energy & Buildings (Elsevier)
- Energy (Elsevier)

I have also been a **frequent reviewer for several premier international conferences**, such as:

- IEEE Conference on Decision and Control (CDC)
- American Control Conference (ACC)
- IEEE Conference on Control Technology and Applications (CCTA)
- IFAC World Congress
- European Control Conference (ECC)
- ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)
- IEEE International Conference on Systems, Man, and Cybernetics (SMC)
- IEEE International Conference on Distributed Computing Systems (ICDCS)
- ACM/ESDA/IEEE Design Automation Conference (DAC)

I have been a **grant proposal panelist for four US National Science Foundation (NSF) review panels**:

- 2024: Pathways to Enable Open-Source Ecosystems (POSE) program.
- 2022: Predictive Intelligence for Pandemic Prevention (PIPP) program.

[3] In the SICCS COFS, international visibility is required for promotion to full professor but not associate professor.

Table 10: *Unfunded proposals, excluding small grant proposals (less than $10K).*

Project Title	Sponsor	Role	Amount
AY 2023–2024			
Combining Formal, Static, and Dynamic Analysis to Verify and Validate Real-World Embedded Systems	NSF	Co-PI	$504K
AY 2022–2023			
Hierarchically Composable Physics-Informed Machine Learning for Modeling and Simulation of Complex Systems	DOE	PI	$740K
Trends and Impact of Public and Workplace Charging Infrastructure in SRP Territory	SRP	Co-PI	$66K
Center for Equitable Workforce Development in Addressing Transportation Cybersecurity Risks (CEDCyber)	DOT	Co-PI	$1.875M
Methods and Software for Physics-Informed Machine Learning of Complex Systems	NAU	PI	$20K
AY 2021–2022			
Physics-Informed, Learning-Based Model Predictive Control for Scalable Energy Management in Campus Buildings	DOE	PI	$450K
Protecting Internet-of-Things and Cyber Physical Systems with Sensors [†]SRC: Semiconductor Research Corporation	SRC[†]	PI	$270K
A Pathway for Combining Formal and Dynamic Analysis of Real-World Embedded Systems	NSF	Co-PI	$720K
Simulation-based analysis of the benefits and impacts of pre-cooling strategies for small to medium commercial buildings in SRP's service territory	SRP	PI	$54K
Optimal Sizing and Siting of Battery Storage at Distribution Level in SRP Territory	SRP	Co-PI	$70K
AY 2020–2021			
A Pathway for Combining Formal, Static, and Dynamic Analysis of Real-World Embedded Systems	NSF	Co-PI	$728K
NA-ComMiT: Northern Arizona Connected Community and Microgrid Testbed	DOE	Co-PI	$6.994M
AY 2019–2020			
STARRNet - Small Town and Rural Area Research Network	NSF	Co-PI	$1.448M
AI Institute: Planning: Infrastructure-Scale Artificial Intelligence	NSF	Senior Per.	–
Data Acquisition, Control and Charging of Drones	NAU	Co-PI	$25K
A Pathway for Combining Formal, Static, and Dynamic Analysis of Real-World Embedded Systems	NSF	Co-PI	$951K
AY 2018–2019			
F1/10: Educational Platform and Community for Safe, Ethical and Agile Autonomous Systems	NSF	Senior Per.	$1.600M
STARRNet - Small Town and Rural Area Research Network	NSF	Co-PI	$1.246M
Analysis and Mitigation of Negative Impacts of Zero Net Energy Homes and Electric Vehicles on Distribution Grids	SRP	Co-PI	$51K
A Pathway for Combining Formal, Static, and Dynamic Analysis of Real-World Embedded Systems	NSF	Co-PI	$877K
AY 2017–2018 (half-year)			
Evaluating the potential environmental and economic impacts for smart buildings and load flexibility as non-wires alternatives in T&D systems	Sloan	PI	$229K
Analysis and Control of Plug-in Electric Vehicle Charging Behaviors on Local Distribution Grids	SRP	PI	$55K
Analysis and Mitigation of Impacts of Electric Vehicle Charging Stations on Distribution Grids	SRP	Co-PI	$60K
Integrated Control of Grid-supportive and Renewable-intensive Connected Buildings	DOE	PI	$653K

- 2021: Cyber-physical systems (CPS) program.
- 2019: Dynamics, Control and Systems Diagnostics (DCSD) program.

4.2 Panelist, Conference Program Committee, and Conference Session Chair and Organizer Activities

I have been a **technical program committee (TPC) member** of the ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) in 2024, the IEEE International Conference on Distributed Computing Systems (ICDCS) in 2019, and the Vietnamese Control and Robotics Workshop (VNCR) in 2022. I have also been the **Publication Chair** of the ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) in 2024. I **co-organized the well-received tutorial session** "Physics-Informed Machine Learning for Modeling and Control of Dynamical Systems" at the American Control Conference in 2023, together with academic and industrial collaborators from the Pacific Northwest National Laboratory (PNNL), the University of Texas at Austin, EPFL (Switzerland), and Mitsubishi Electric Research Laboratories. In addition, I **chaired or co-chaired several technical sessions at international conferences**:

- Technical session "Model Predictive Control" at 2021 IEEE Conference on Control Technology and Applications (CCTA).
- Technical session "Predictive Control for Nonlinear Systems II" at American Control Conference 2019.

Finally, I was a panelist on the Artificial Intelligence (AI) panel "Accelerating into the Future" at the Flagstaff Festival of Science in 2018.

4.3 Invited Speaker

In addition to giving contributed talks at conferences, workshops, and colloquia (see my CV in Appendix F for more details), I have also been an **invited speaker** at the following institutions:

- The Lawrence Berkeley National Laboratory (LBNL) – Building Technology and Urban Systems Division (2020)
- The School of Sustainable Energy Engineering of Simon Fraser University in Canada (2021)
- The University of North Carolina at Charlotte (2023)
- Old Dominion University (2023)
- The Knight Foundation School of Computing and Information Sciences of Florida International University (2023)

4.4 Other Activities and Recognition

Due to my scholarship accomplishments, I was promoted to **Senior Member of the Institute of Electrical and Electronics Engineers (IEEE)**, the highest grade for which IEEE members can apply.

5 Conclusion

As an assistant professor, I have **published 29 peer-reviewed papers, with 4 additional papers currently under review**. Many of my papers were published in highly reputable conferences and journals. My work effort on these papers was very high, as I was the lead author or one of the lead authors on 13/33, my students were co-authors on 10/33 (where I had a mentoring role in the effort),

7 of which as lead authors, and I was a senior/supervising author on 11/33. Overall, I had a significant role and effort on 21/33 papers. Since I joined NAU, my publications have won a best paper award at a top conference in my field and a best presentation award, and my number of citations has increased from 491 to 1278 with the h-index rising from 11 to 18.

I am the recipient of the **NSF CAREER** award and the **NSF ERI** award. I have been successful at obtaining extramural funding, at a total of **$11.05M in grants** (**$10.95M in extramural grants**) with **$2.57M under my management** (**$2.55M in extramural grants**). These grants have supported my research program at NAU and fit well into my overall research agenda.

Furthermore, I have gained national (and international) visibility, as evidenced by my participation on three NSF review panels, my membership on several technical program committees, my contribution in organizing and chairing several technical sessions at premier international conferences, and my reviewing activities for several top-tier journals and international conferences. I have also been an invited speaker at several institutions in the United States and Canada, including the Lawrence Berkeley National Laboratory, Florida International University, University of North Carolina at Charlotte, Old Dominion University, and Simon Fraser University (Canada).