



AAEC WASHINGTON STATE UNIVERSITY

Agricultural Automation and Engineering Club

Biological Systems Engineering Department

 Agricultural Automation and Engineering Club (AAEClub)



Greetings from the AAEC Club Advisor



Dr. Manoj Karkee
Club Advisor/ Associate
Professor

Washington State
University

First of all, congratulations to the AAEC club on the effort to start publishing an annual newsletter. The newsletter will provide an opportunity to share the accomplishments of the club to the department and wider university community and provide a benchmark as the club continues to flourish in the future.

I have been privileged to get the opportunity to work with a dynamic and creative group of students organized around Agricultural Automation Engineering Club since its inception in 2012. The club was established to facilitate the collaboration and exchange of knowledge between engineering students, faculty, and the department and research centers while fostering a close relationship among them and helping in developing both professionally and academically. Since its inception, the club has been instrumental in organizing various activities and in volunteering to university and professional events to achieve these goals. Over the past year (2017), the club organized a lot of creative activities that have benefited the students and the units (department and centers) they belong to through the opportunity for professional development, closer interactions between students, professors and staff, and understanding of diverse culture and values from around the world. Activities like invited seminar on “Engineering a Small Business” (given by Dr. Mark De Kleine, 2014 WSU graduate) and organization of ‘Multi-cultural Night’ at WSU IAREC (Prosser Campus) have benefited not only the club members but also other students and members of wider university community. Activities like visiting tour to the METER Group Inc. (Pullman, WA) have provided valuable

opportunities to all members to experience the industrial culture. The club has also made wider impact to their profession by participating in various activities of ASABE (American Society of Agricultural and Biological Engineers) including volunteering to provide logistical support (e.g. building boards for competition) and judging the teams during 2017 ASABE student robotic competition.

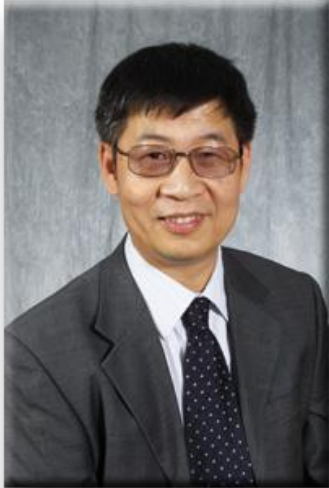
I have found that the club members are highly engaged through regular meetings and activities, and are always enthusiastic about new ideas they would like to explore. Most importantly, the club has been providing much needed care and support to fellow students, particularly when new students join the department and therefore has played a great role in creating 'a home away from home' for so many students in the department and research centers. The club is unique because the members are geographically distributed (e.g. Pullman & Prosser) and therefore this role the club has been playing is even more crucial.

Once again, congratulations on a very successful year behind the mirror, and my best wishes for a fruitful upcoming year and beyond.



Manoj Karkee,
AAEC Student Club Advisor
Associate Professor
Biological Systems Engineering Department
Center for Precision and Automated Agricultural Systems
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Foreword



Qin Zhang, PhD
Director, Center for
Precision and
Automated Agricultural
Systems

Dear AAEC members:

As the Director of CPAAS, I am very pleased to see the growth of AAEC, and more importantly the success AAEC members have achieved. I remember when almost every one of you first came to CPAAS, and have witnessed your achievements academically and professionally over only a few very short years. I have also witnessed the professional development of some of the early members of AAEC who are now either fruitful educators/researchers at some leading institutes or productive engineers at some world-class companies. I do sincerely hope that your life here at CPAAS will leave you with some happy and unforgettable memories as it provides a dashboard for your achieving your career goals and realizing your life dreams. *Go Cougs!*

Qin Zhang, PhD

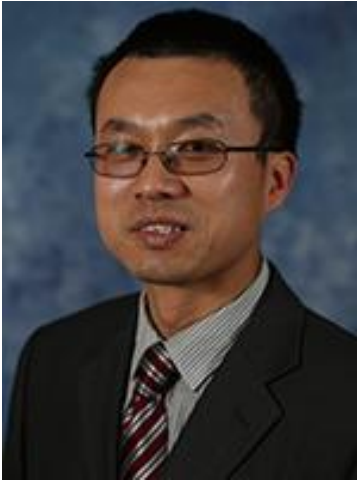
Director, Center for Precision and Automated Agricultural Systems

Professor, Biological Systems Engineering

Washington State University

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Foreword



Dr. Jianfeng Zhou
Founder of AAEC
Assistant Professor
University of Missouri

As a former AAEC member and one of the founders of AAEC, I am so proud to see her growth in such a good track with your thoughtful cares. Every member of the AAEC is part of the agriculture engineering community, who are frontiers in developing and applying emerging technologies for agriculture. Agriculture will not fly without technologies. We are in the digital ear, and it has never been more important than what we are doing now in securing food production for the growing population globally. I believe that AAEC is such a good home to foster creativity, collaboration and profession in agricultural automation and engineering. As a distinguished member of the AAEC, they can make difference.

Go Cougs!

Dr. Jianfeng Zhou,
Founder of AAEC
Assistant Professor
University of Missouri
zhoujianf@missouri.edu



Greetings from the AAEC present club officers



Xin Zhang
President, AAEC

I need to first thank all AAEC officers and members for your valuable supports and help. It has been my real honor to get the opportunity serving this small but productive community as a President in 2018. Last year, I was really impressed by the enthusiasm and creativity from this club, when I was just a fresh member of it. All members actively get involved in many kinds of activities inside or even outside of the 'club time', which makes AAEC grow up in a good and healthy track in 2017. Now, it is our time to power it on once again. Go Cougs! Go AAECers!

Xin Zhang
President, AAEC



Rakesh Ranjan
Vice-President, AAEC

Hello readers, Greetings!!! Just few weeks ago, I was planning for a cultural potluck for AAEC and in one of document I had to report "what Kind of food you are serving" and my answer was food from all over the world. Our club is basically medley of diverse culture and we have members from almost all the continent of the world. We truly represent the unity in diversity when we work together in synchronization for any club event and sometimes I feel really proud to lead such a unique and productive group. This is first edition of newsletter for AAEC, and I hope you would like and appreciate our work. Happy reading, Go Cougs.

Rakesh Ranjan
Vice-President, AAEC

Greetings from the AAEC present club officers



Yaqoob Majeed
Secretary, AAEC



Abirami Rajendran
Treasurer, AAEC

As this is our first newsletter, I would like to thanks to the founding members of this club who provided the great platform to polish the academic and nonacademic skills in the form of professional development lectures, industrial tours and multicultural nights. We will strive our best to keep the peculiar tradition of this club and make it proud for the Cougs by taking it to the new heights of glory and achievements. Go Cougs!

Yaqoob Majeed
Secretary, AAEC

Hi AAEC members, it's a great pleasure to be a part of this club. This club consists of different cultures from all over the world and makes each member experience different traditions and cultures. In addition, this club aims at academic activities for benefits of AAEC members. As an AAEC officer, I hope we continue to work for benefits of AAEC members attaining more success in future.

GO COUGS!
Abirami Rajendran
Treasurer, AAEC



Greetings from the AAEC former club officers



Carlos Luis Zuniga
Former President, AAEC

I am Carlos and I was President of AAEC for two years. To serve as a President of the organization was a great honor and a great challenge too. We needed to find funds that benefit in the same way members located in Pullman and Prosser. And we did it with the effort of the officers and members. We could give identity to our club and also, we were able to organize and create unit between the members in Pullman and Prosser. I feel proud about what we have done. I just want to thank members for the opportunity to lead this organization, and I wish you all the best in future.

Carlos Luis Zuniga
Former President, AAEC



Sanaz Jarolmasjed
Former Secretary, AAEC

When I started my graduate studies in WSU, I was thirsting to explore new prospects in self-improvement, communication, and leadership. After becoming involved in Agricultural Automation and Engineering Club, I learned how to communicate, connect with others and put thoughts into action. Serving as the secretary of the club, improved my transferable skills and contributed to the professional development that I will carry with me throughout my education and career. I wish the best for the new administration, and I am sure that this Club will continue to grow and prosper.

Sanaz Jarolmasjed
Former Secretary, AAEC

Greetings from the AAEC former club officers



Rajeev Sinha
Former Vice
President, AAEC

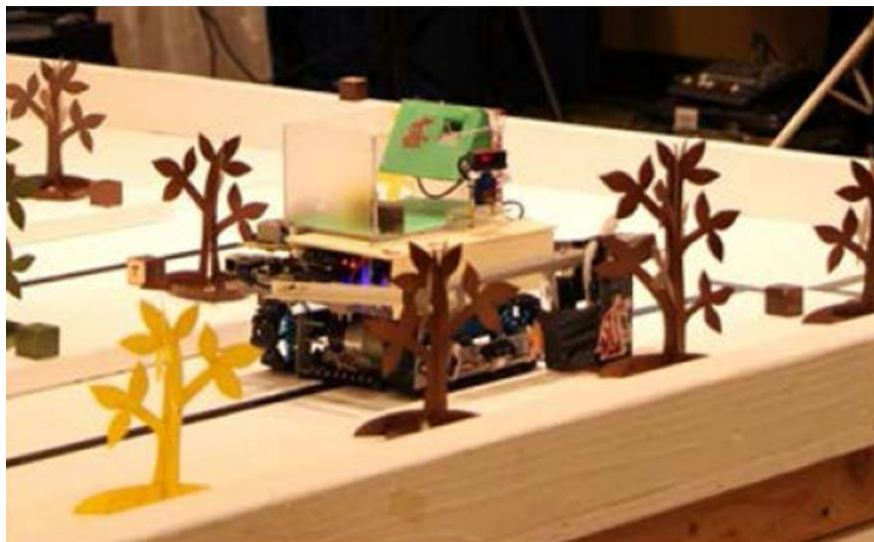
Every journey in life has a beginning and my journey towards becoming the Vice President of Agricultural Automation and Engineering Club (AAEC) at Department of Biological Systems Engineering (WSU) was no exception. I was nominated and selected for the job when I was spending time back home with my family and the news came as a surprise to me. Although I was not ready for the job, my adventurous and inquisitive nature compelled me to accept the position. I knew that I will have to impart extra hours to this, however, I also knew the job was going to provide me with highly desired qualities like leadership, organizational and communication skills. I started working with other officers of the club to plan

and execute events in social, cultural and academic domains for the club members and other students at our research and extension center at Prosser. Being in the office, I was able to conduct meetings with the club members to get their opinions about the events of the club. Moreover, I was also instrumental in organizing events like 5K Run, Multi-cultural Night, Research Showcase and Guest Speeches, which received attention from the community. Overall, my experiences as the Vice President of the AAEC were just phenomenal. I wanted to serve the club for long, but decided to hang up my boots, so that someone else could go through the same inexplicable experiences as I did. It is rightly said that the best quality of a leader is to create leaders. I wish all success to the new officers of the club and would like to share a piece of advice from my experiences. At the start, it seems really a herculean task to get active participation from the students in the club. However, things change when the officers put more than 100% efforts. So, don't feel low if you witness something like that, keep doing the good work. At the end I would like to quote Jimmy Dean who once said, "I can't change the direction of the wind, but I can adjust my sails to always reach my destination". Good luck and Go Cougs.

**Rajeev Sinha
Former Vice President, AAEC**

AAEC club activities

Our club's mission is to encourage the collaboration and exchange of knowledge between engineering students, faculty, and the department while fostering a close relationship among them and helping in developing both professionally and academically. This club helps members to strengthen their research capabilities and skills as well as curricular and co-curricular competences with various activity spread from the industrial visits, professional development lectures to the social gatherings.



Participating in events such as robot competition in ASABE conference 2015

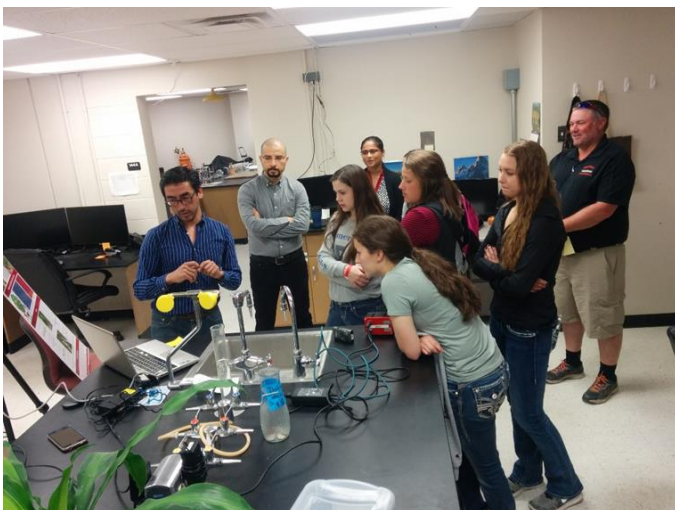


Club extension programs to meet and visit Pomeroy high school through FFA program for their presentation for the FFA's Agricultural issues contest.

AAEC club activities



Club brain storming meetings



Introducing the new technologies in agriculture by inviting high school students to visit the lab and presenting to them.

AAEC club activities



Invited speaker on the topic of “How to be a successful graduate student” in Prosser, research and extension center with lunch that was partially funded by Graduate and Professional Student Association (GPSA).



Visiting “Meter” company with all the club members. This event was partially funded by GPSA.

AAEC club activities



ASABE (American Society of Agricultural and Biological Engineers): volunteering to provide logistical support (e.g. building boards for competition) and judging the teams during 2017 ASABE student robotic competition.

Invited seminar on “Engineering a Small Business” (given by Dr. Mark De Kleine, 2014 WSU graduate).



Invited seminar on “Empower genomic research with continually improved statistical methods and computing tools” (given by Dr. Zhiwu Zhang, Assistant Professor and Endowed Chair (WGC) for Statistical Genomics, Molecular Plant Sciences, WSU).

AAEC club activities



Club member reach out event



“BBQ” party in Prosser was part of the club brainstorming meetings in which ideas were discussed and plans were made to boost up the club activities.

“Multicultural Night” organized by the AAEC to bring the people of diverse culture close and share their culture and values. There were stalls and presentations from different countries (i.e. US, China, Nepal, India, Pakistan, Taiwan, Chile, etc.) of the world to show their culture.



Achievements of AAEC members

Carlos Zúñiga Espinoza

Ph.D. candidate in Biological and Agricultural Engineering

Publications:

- High Resolution Multispectral and Thermal Remote Sensing-Based Water Stress Assessment in Subsurface Irrigated Grapevines. Remote Sensing, 9, 961

Awards and Recognition

- Third place poster competition in Washington winegrowers 2018 convention and trade show, Kennewick, WA.
- Imagine Tomorrow Alaska Airlines travel award to attend and participate in Phenome conference 2018, Tucson, AZ.
- Biological Systems Engineering Department travel grant to participate in ASABE conference, Spokane, WA, 2017
- Biological System Engineering Outstanding Graduate Student Award, 2016
- Biological Systems Engineering Department travel grant to participate in ASABE conference in Orlando, Fl, 2016

Sanaz Jarolmasjed

Ph.D. candidate in Biological and Agricultural Engineering

Publications:

- Hyperspectral sensing of stomatal conductance to monitor the efficacy of exogenous abscisic acid applications in apple. Crop Protection. [Accepted]
- Near infrared spectroscopy to predict non-invasive bitter pit development in different varieties of apples. Journal of Food Measurement and Characterization, pp. 1-7.

Awards and Recognition

- 2016-2017 Biological Systems Engineering Outstanding Graduate Student Award
- College of agricultural, human, and natural resource sciences representative in GPSA, WSU, 2017-present
- Graduate student representative in faculty senate-Graduate Studies Committee, WSU, August 2016-present
- Secretary of Agricultural automation engineering club, WSU, April 2016-present

Achievements of AAEC members

Chongyuan Zhang

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Application of non-invasive high-throughput phenotyping on legume crops

Publications:

- Spectrometric techniques for elemental profile analysis associated with bitter pit in apples, Postharvest Biology and Technology.
- Sensing for stress detection and high-throughput phenotyping in precision horticulture. (In 'Automation in Tree Fruit Production: Principles and Practice')- Book chapter

Awards and Recognition

- Arnie and Marta Kegel Endowed Fellowship, Graduate School of Washington State University, 2018.
- Ann Chittenden Holland Master's Thesis Award for Graduate Student Excellence, Graduate School of Washington State University, 2018.
- Boyd-Scott Graduate Research Award, ASABE, 2017.
- Biological Systems Engineering Travel Award, Biological System Engineering, 2017.

Afef Marzougui

M.S. candidate in Biological and Agricultural Engineering

Research area: High-throughput phenotyping for root rot disease resistance in Lentil crops

Conferences

- High-throughput phenotyping for assessing Aphanomyces root rot disease resistance in lentils, ASABE, 2017.
- An image-based pipeline for quantifying Aphanomyces root rot disease severity in lentils, Plant and Animal Genome (PAG), 2018.

Achievements of AAEC members

Abirami Rajendran

M.S. candidate in Biological and Agricultural Engineering

Research area: Biogenic marker identification for high-throughput phenotyping of aphnomycetes resistance in pea

Abhilash K. Chandel

Ph.D. candidate in Biological and Agricultural Engineering

Publications:

- Thermal-RGB imager derived in-field apple surface temperature estimates for sunburn management

Haitham Yaqout Bahlol

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Spray technology

Awards and Recognition

- ASABE Travel award, Department of Biological Systems Engineering, 2017.
- ASABE Travel award, Department of Biological Systems Engineering, 2016.

Conferences

- Smart spray analytical system for orchard sprayer calibration: a-proof-of-concept and preliminary results, ASABE AIM, 2016.
- Development and evaluation of an automated vertical spray patternator for calibration of vineyard air-assist sprayers, ASABE AIM, 2017.
- Thermotherapy with Horticulture Mineral Oil for pear psylla management, ASABE AIM, 2017.

Achievements of AAEC members

Rajeev Ranjan Sinha

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Solid set canopy delivery (SSCD) system customized for apple orchards and vineyards in Washington State

Publications:

- Rapid and non-destructive detection of *Pectobacterium carotovorum* causing soft rot in stored potatoes through volatile biomarkers sensing (2017), Crop Protection.
- FAIMS based sensing of *Burkholderia cepacia* caused sour skin in onions under bulk storage condition (2017), Journal of Food Measurement and Characterization.

Awards and Recognition

- GPSA Travel award to attend ASABE 2016 at Orlando, Florida.
- BSYSE Travel Award to attend ASABE 2017 at Spokane, Washington.
- Arnie and Marta Kegel Endowed Fellowship for Biological Systems Engineering Outstanding Graduate Student Award at Washington State University, 2017.

Momtanu Chakraborty

M.S. in Biological and Agricultural Engineering

Research area: Developing rapid crop canopy assessment methods using ground and aerial remote sensing techniques

Publications:

- Applicability of time-of-flight based ground and multispectral aerial imaging for grapevine canopy vigor monitoring under direct root-zone deficit irrigation, International journal of Remote sensing.

Awards and Recognition

- Awarded 2nd price in poster presentation in Washington State University.

Rakesh Ranjan

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Internet of things based automated solid set canopy delivery system for sunburn and frost management in Washington State apple orchards

Achievements of AAEC members

Lin Chen

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Weeding Robot System for Vegetable Fields in Pacific Northwest Region

Publications:

- Design and Evaluation of a Levelling System for a Weeding Robot, IFAC-online.

Conferences

- Design and Evaluation of a Levelling System for a Weeding Robot, IFAC-5th, 2016.
- Weed Identification Rate Analysis for Different Growing Period, ASABE, 2017.

Santosh Bhusal

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Bird Deterrence in wine grapes using Unmanned Aerial Systems

Awards and Recognition

- Awarded 3rd price in poster presentation in Washington State University.

Conferences

- Bird detection, tracking and counting in wine grapes, ASABE AIIM, 2017.
- Detection and localization of birds for Bird Deterrence using UAS, ASABE AIIM, 2017.
- Raspberry primocanes bundling and tying mechanism, ASABE AIIM, 2017.



Achievements of AAEC members

Kapil Khanal

M.S. candidate in Biological and Agricultural Engineering

Research area: Cane Management in Red Raspberry Industries: A Proof of Concept Towards Mechanization.

Conferences

- Raspberry primocanes bundling and tying mechanism, ASABE AIIM, 2017.
- Bird Detection, Tracking and Counting in Wine Grapes, ASABE AIIM, 2017.

Xin Zhang

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Intelligent Canopy Managements for Mechanized Precision Tree Fruit Production.

Publications:

- A Precision Pruning Strategy for Improving Efficiency of Apple Vibratory Mechanical Harvesting, Transactions of ASABE.

Awards and Recognition

- Arnie & Marta Kegel Endowed Fellowship, 2017, Washington State University.

Conferences

- A Study of the Influence of Pruning Strategy Effect on Vibrational Harvesting of Apples, ASABE AIIM, 2017.



Achievements of AAEC members

Yaqoob Majeed

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Automatic Solution for Labor Intensive Branch Training in Trellis Trained Apple Trees.

Awards and Recognition

- Awarded 1st price in poster presentation in Washington State University.

Zongmei Gao

Ph.D. candidate in Biological and Agricultural Engineering

Research area: Detection of grapevine leafroll disease on red-berried vine using hyperspectral imaging

Conferences

- Early detection of grapevine leafroll disease on redberried vine using hyperspectral imaging, ASABE 2017.
- Early detection of grapevine leafroll disease on redberried vine using hyperspectral imaging, CPAAS Ag. Tech Day, 2017.



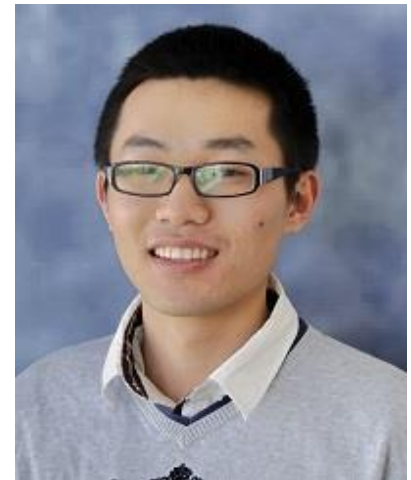
AAEC e-Mentoring



Dr. Longsheng Fu,
Associate professor,
Northwest A&F University,
China
Email address: fulsh@nwafu.edu.cn

Dr. Yunxiang Ye
Haisheng Company (China)
Senior Engineer
2016 WSU Graduate

Email address: yeyx6263@outlook.com



Dr. Long He
Assistant Professor
Pennsylvania State University
Email address: luh378@psu.edu

Graduating AAEC members



Momtanu Charaborthy

Graduating with MS. (Fall 2017)



Carlos Zuniga Espinoza

Graduating with PhD. (Spring 2018)



Sanaz Jarolmasjed

Graduating with PhD.(Spring 2018)



Abirami Rajendran

Graduating with MS.(Spring 2017)



Congratulations!

Acknowledgement

- FEC club and the President of FEC, Pavitra Krishna Kumar for their support in guiding in formatting newsletter.
- Drs. Manoj Karkee and Qin Zhang for your valuable support.
- All the former officers for your kind support and guidance.

