

PoultryTech

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Researchers Continue to Optimize Novel Filtration System for Water Recycling and Byproduct Recovery in Poultry Processing

Georgia Tech Research Institute (GTRI) researchers continue to optimize a Dynamic Filtration System to improve water recycling and byproduct recovery for poultry processing operations. The U.S. Food Safety and Inspection Service (FSIS) regulates and issues compliance guidelines for water reuse applications. An ongoing challenge is developing cost-effective technologies that achieve needed physical, chemical, or microbiological improvements in the reuse water. The GTRI filtration research is focused on ensuring particles are stopped before the filter and removed as quickly and cost-effectively as possible.

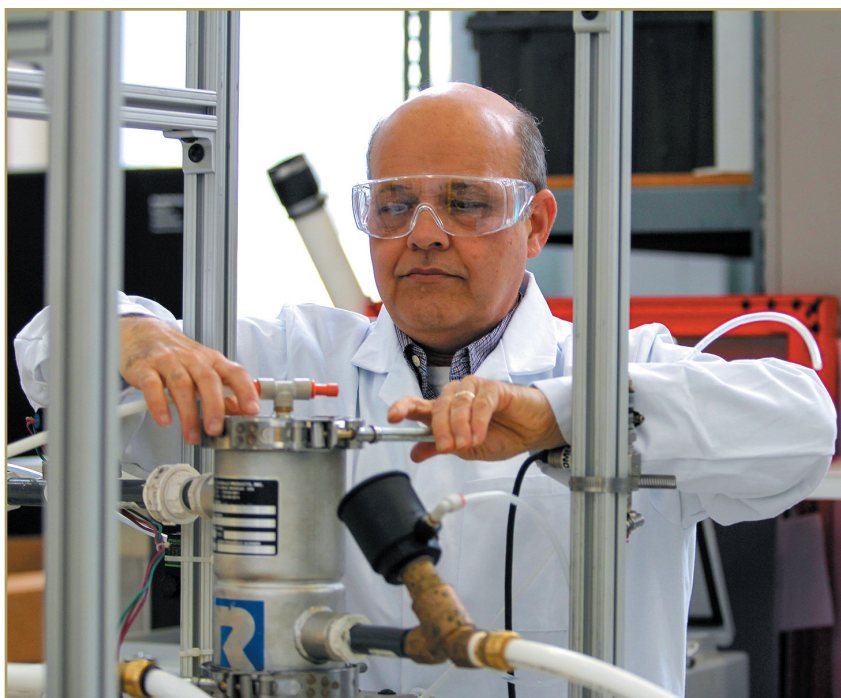
Indeed, the patent-pending working prototype has validated a design that enables a small footprint with 90 percent volumetric throughput efficiencies while still providing filtration proficiencies evaluated down to 75 microns.

“Our filtration method delivers significant advantages over other filtration methods in that deployment provides both beneficial water recycling and value-added material recovery. In concert, increased food safety with decreased intervention chemistries results,” says John Pierson, GTRI principal research engineer and project director.

These advantages are largely due to the system’s ability to leverage an enlarged filter area. Pierson says the team recently successfully moved from a flat plate filter to a 3D-type system similar to a strainer basket. They built a prototype using a clear polycarbonate tube so they could observe the flow through the filter.

“Our goal has been to conduct an on-site pilot demonstration of the new design that increases the overall filter area while maintaining a small footprint. The upgraded design, while not yet operated on-site, has beneficially changed the flow field and pressure profile within the system,” notes Pierson.

Researchers were concerned that the desired pressure gradient across the effective filter area would suffer when the system was scaled-up. However, the upgraded system performs better during the backwash cycle while reducing the overall footprint.



John Pierson, GTRI principal research engineer, clamps the housing holding the 75-micron filter in advance of running the Dynamic Filtration System. PEX tubing allows for sanitary operation.

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MANAGER'S CORNER

Adapting to a New Normal Amid the Coronavirus Pandemic

2020 will certainly go down as a year in which our predictive vision was far from 20/20. Our hearts are certainly heavy as we hear of family, colleagues, and friends who have been personally impacted by the COVID-19 virus. We have all felt the effects and had to adapt and change both our personal and professional lives in an effort to minimize the broader impacts of this virus.



The Agricultural Technology Research Program (ATRP) has adopted all of the standard and recommended precautions, such as transitioning research teams to remote working and maintaining social distancing for those who must visit the office and labs. This did cause some disruption to several research projects that were either actively engaged in or preparing to deploy field trials.

Fortunately, most of these research efforts were able to pivot to in-lab testing or transitioned to other aspects of the research that could be done remotely. In addition, for the first time ever, we conducted an online ATRP Advisory Committee update in place of our annual in-person event, which we hope to be able to hold in September.

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In response to the Governor's Office and University System of Georgia requests, ATRP has submitted management plans for a 14% budget reduction in FY21. While this will clearly have an impact on the program, our goal is to continue to provide the highest quality service and research to our partners and stakeholders.

In terms of good news, several ATRP researchers have been supporting the COVID-19 response efforts. These include investigating alternative methods for automated disinfection, novel approaches for contact tracing within facilities such as hospitals, and developing rapid and reliable COVID-19 testing methods. This last project leverages our prior work on the optical biosensor platform and hopes to provide a rapid alternative to current testing methods. Through these efforts, we are excited to do our small part in helping the state and our industry stakeholders recover from this devastating pandemic.

Our focus can sometimes become blurred by the chaos of change and the exhaustion we feel trying to adjust to the shifting landscape. However, it is important that we not miss the opportunity to reassess our priorities and take inventory of our activities and outcomes.

As communicator, author, and pastor Andy Stanley has so eloquently stated, "A new normal is coming. If we're wise, we'll reflect on what we've learned and what we want to carry forward. After all, pain without any gain is a shame. So, how can we be better for it?" Within ATRP, we will certainly be contemplating this as we begin this summer.

As always, we value you, our partners and stakeholders, and appreciate your support, input, and feedback as we continue to work toward our vision of *Transforming Poultry, Agribusiness, and Food Manufacturing through Advanced Technologies*. ♥

A handwritten signature in black ink that reads "Doug Britton".

Doug Britton, Ph.D.
ATRP Program Manager

RESEARCH UPDATE

Multitasking Robot Tends to Poultry Flocks in Growout Houses

BY COLIN USHER

We live in unprecedented times. A novel virus (COVID-19) is spreading across the globe like wildfire, shutting down entire countries and wreaking havoc on all industries including food production. On top of that, a highly pathogenic avian influenza (HPAI) H7 was confirmed in a commercial poultry flock along the Mississippi Flyway in early March, the first such outbreak in the United States since 2015. This has dealt a double blow to the poultry industry and highlights the need for safe and effective bio-safety practices, both for humans and chickens.

This new environment we find ourselves in has created a surge of interest in robotic systems. China and Italy recently bought dozens of robots utilizing 254 nanometer UVC light for disinfecting hospital beds and rooms. China even deployed robots to assist with taking patient's temperatures and delivering food, allowing the doctors and nurses to have reduced contact with virus-stricken patients. Even big-box retailers are starting to utilize robots for carrying out janitorial tasks. These are but a few examples highlighting how robots could prevent human contact from spreading the virus.

Researchers in the Georgia Tech Research Institute's Food Processing Technology Division have been working for several years on the development of a robotic system that can tend to poultry flocks. Like these robots introduced in the medical field, a primary motivating factor in this research is to reduce the chance of contamination and introduction of disease into the flocks. The idea is a simple one: the more that a robot can do, the less a person needs to intervene, reducing their need to enter the houses and therefore reducing the opportunity for contamination.

Currently, there are a handful of robot systems available for working in commercial houses. Each of these systems primarily carry out a single task, such as monitoring the flock, or encouraging flock movement, and even disinfecting. With these single purpose systems, humans still have to enter the house on a daily basis to

carry out manual tasks such as removing mortality or picking up floor eggs. With this in mind, the research team set out to design a robot that can carry out as many tasks as possible, reducing and even eliminating the need for a human to enter the house at all.

To this end, the robot has to be able to move autonomously through the flock, actively sensing the birds and reacting to them so as not to harm them. This work was completed in 2015 and was demonstrated with successful field tests in 2016 where the robot navigated among a flock in a commercial house. To date, the robot has operated fully autonomously in commercial houses and smaller scale test houses replicating commercial facilities for multiple hundreds of hours.



Field testing demonstrates GTRI's poultry house robot's capability to autonomously pick up floor eggs.

However, autonomous navigation is only the first task the robot must be able to do if one wants to remove humans from the equation. The robot must be able to identify chickens and equipment and provide information to farm management. Artificial intelligence routines were added to the robot allowing it to detect chickens, feeders, drinkers, and even eggs. These developments were demonstrated in 2017 and 2018.

With the ability to detect chickens and eggs, a small robotic arm was added to the platform, and routines for approaching and automatically removing the floor eggs were developed. This required the development of novel routines that allow

Colin Usher is a senior research scientist in the Georgia Tech Research Institute's Food Processing Technology Division.



the robot to search spaces, ensuring the entire area is covered. The robot is now able to search an entire commercial broiler-breeder house floor, find eggs, drive up to them, pick them up, and remove them from the house. Field testing in a small-scale test house yielded a success rate of greater than 90 percent in picking up floor eggs. Testing in actual commercial houses was planned for this year, but has been postponed due to the virus outbreaks.

With the ability to autonomously navigate the houses, identify chickens and equipment, and find and pick up floor eggs, one significant task remains that requires humans to enter the houses on a regular basis. This task is removal of mortality. Current work on the robot is focusing on the ability to detect and remove mortality. To this end, a custom robot arm was developed that is both low-cost and strong enough to pick up full-grown chickens. A prototype arm was developed and

demonstrated in 2019 for picking up chickens weighing up to 20 pounds. This effort is currently ongoing.

While the world focuses on hospitals and hot spots for humans, opportunity exists for improving the state of the industry with animals as well. In an editorial published in the journal *Science Robotics*, experts suggested that more needs to be done now. They also remind us that similar plans for robotic assistance were created after the 2015 Ebola outbreak, but the funding and motivation dropped off when the outbreak was resolved. Perhaps interest in these systems can be sustained a little longer this time. ♥

Collaborative Robotics

BY KONRAD AHLIN, PH.D.

Many times in industry, certain tasks will be performed by robotic devices. These machines might be employed because of their speed, strength, or reliability. However, traditional robots are often large and potentially hazardous to people that need to work around them. To compensate, two strategies might be utilized. The robot could be put within a cell, in which access to the machine is severely restricted in the interest of safety, or the robot could be redesigned to work with and around human operators. This approach, in which the robot is specially made to be safe for use around people, is known as collaborative robotics.

As the name suggests, a collaborative robot (designated as “cobot” in early literature but often seen now as “CoBot”) is designed to share tasking with people. This cooperation might be as simple as utilizing robots without a work cell, or it might be as integrated as having humans and robots operating on the same task simultaneously. The concept of the CoBot was initially coined by professors Michael Peshkin and J. Edward Colgate from the Northwestern University in Illinois in the 1990s. Their original idea for CoBots was to combine the human intellect with a robot’s strength and accuracy. In their research, they detail several different types of machines that utilized sensors and specialized mechanisms such that they could be operated directly by people and still maintain industry levels of safety.

In modern robotics, CoBots are often referenced when discussing robotic arms (manipulators typically consisting of six or seven revolute joints). Most well-known robotic manufacturers have their own CoBot design, including KUKA, FANUC, and ABB. However, some companies uniquely specialize in collaborative robots, such as Universal Robots.

The reason for CoBots today is the same as when they were first being explored; tasking that requires human

intervention must be safe. However, a modern benefit of CoBots is cost. Large robots that are designed to move quickly or carry large payloads require expensive parts for construction. They generally need specialized programming by certified experts. They also require their own, quarantined space on the factory floor where they can be segregated from human operators. CoBots, in contrast, typically have less payload capacity and speed capabilities, but they are lighter, cheaper, and more versatile than their heavy-weight counterparts.

A surprising feature of modern CoBots is the ease with which they can be integrated into existing processes. Since



Stephanie Richter, GTRI research scientist, operates a research robot arm to automatically load a carcass on a cone, demonstrating a poultry processing task that could potentially benefit from collaborative robotics.

they are meant for working alongside human operators, they can be programmed directly by human instruction. All they require is guidance (by programming or by hand), and then they can replicate motions that have been taught. The result is a relatively inexpensive unit that can be integrated into existing systems to offer machine-level accuracy and precision while working alongside human operators.

The modern poultry industry requires manual operations in order to perform the necessary processing of its product.

Konrad Ahlin, Ph.D., is a research engineer in the Georgia Tech Research Institute's Food Processing Technology Division.



Unlike traditional manufacturing, food processing involves manipulating objects that are heterogeneous and have wide uncertainties involving the incoming product’s size and weight. As a result, traditional manufacturing methods are either inefficient or insufficient for primary and secondary operations on product, such as handling and deboning. Conventional robots perform best when the tasking is routine and methodical, which leads them to struggle in the meat processing industry, where tasking is subject to variations and requires dexterous handling.

However, sophisticated CoBots, with intelligent sensing and controls, could aid in modern processing tasks. From primary operations, such as collecting and sorting product, to secondary operations, such as deboning and cutting, CoBots could be the tool that augments current line procedures. Rather than trying to replace operators with large and expensive machinery that lacks a human’s sophistication, CoBots allow industries to insert robotic levels of precision alongside a human’s expertise. Many avenues of modern industry will be affected by CoBots in the near future.

Advancements in robotics are growing rapidly, and each new step forward brings large swaths of industry under the domain of robotic tasking. CoBots offer an exciting avenue of introducing robust, streamlined, low-cost robotics into an industry reliant on human judgement and dexterity, and their use will shape the future of the poultry world. ♥

Researchers Continue to Optimize Novel Filtration System for Water Recycling and Byproduct Recovery in Poultry Processing

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In addition to the system scale-up, Pierson says the team has continued to explore filter chamber designs and efficient connections with an oscillating pressure generator.

The initial bench-scale devices, which used flat plate filters, allowed for simple attachment of the filter to the pressure generator. However, the transition to the expanded filter chamber that houses the 3D filter has made finding off-the-shelf components for coupling the filter to the pressure generator more challenging. This was particularly the case when trying to ensure adequate sanitation of the system with minimal assembly and disassembly. “For water recycling and value-added product recovery, having a system that is easily cleaned is critical, particularly when the on-site pilot system is moved from off-line to side stream sampling for testing,” explains Pierson.

The challenge now is obtaining an adequate supply of process water or generating a simulated liquid stream that allows the team to demonstrate the system working for an extended period at a reasonable flow rate. Pierson says the team is working with other GTRI projects that are focused on characterizing relevant liquid streams, such as poultry chillers, to determine the most effective ways to demonstrate related technologies.

“We understand the importance of validating that the system is ‘fit for purpose’ and that is most efficiently and effectively done on-site, filtering the target liquid stream as it is generated,” notes Pierson. “We have tested various simulated processing waters that incorporated poultry and feather meals since those materials contain fat and protein. While not exactly the same, these materials do slowly coat the fine screen surfaces. In operation, we have used filter ripening and filter layering to maintain flux rates.”

“We believe our innovative approach has the potential for more frequent and targeted backwashing, which means higher flux rates can be obtained for extended periods. Greater levels of separation can be achieved through serial applications deploying finer meshes or membranes, and the system is designed to enable water reuse and recycling while recovering food grade fine suspended solids like fats and proteins. The result is flexibility regarding where and how the devices are used, yielding a versatile system for achieving the industry’s evolving corporate social responsibility and sustainability goals.”

– John Pierson, GTRI principal research engineer

Now, the question remains whether the upgraded pilot system designed to process 15 to 25 gallons per minute will provide the desired recovery of roughly 80 percent of loaded organic material with an 85 percent or greater throughput efficiency that has been demonstrated in the laboratory.

Demonstrating that the system can effectively operate given the fat and protein loads found in poultry liquid streams remains the team’s final goal. Researchers hope to conduct on-site testing at a poultry processing facility in the near future.

“We will probably begin by capturing a side stream of a chiller or other process where the overflow water is otherwise discharged to wastewater. This will help ensure there are no food safety concerns. We will characterize the filtrate or filtered water and determine the amount of solids that are captured,” says Pierson.

The research team is actively seeking to identify commercialization partners to transfer this technology, and these results should provide the necessary data to confirm the system’s viability and bring the team one step closer to producing a commercial system.

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backwashing, which means higher flux rates can be obtained for extended periods. Greater levels of separation can be achieved through serial applications deploying finer meshes or membranes, and the system is designed to enable water reuse and recycling while recovering food grade fine suspended solids like fats and proteins. The result is flexibility regarding where and how the devices are used, yielding a versatile system for achieving the industry’s evolving corporate social responsibility and sustainability goals,” says Pierson. ♥

INDUSTRY NEWS

USPOULTRY Provides COVID-19 Information and Resources on Dedicated Webpage

There is a great deal of uncertainty about the ongoing impact of coronavirus (COVID-19) and its impact on the poultry industry and the United States as a whole. In response, the U.S. Poultry & Egg Association (USPOULTRY) has created a webpage with continually updated links to COVID-19 information and resources from various government agencies, including the CDC, OSHA, USDA, FDA, EPA, and DOL, to name a few. There are also links to coronavirus-specific guidance from the public health departments of all 50 states.

Visit uspoultry.org/COVID-19 for the latest information on the current situation, emergency planning tools, and recommended control measures. ♥

R. Harold and Patsy Harrison Foundation Commitment Launches ATRP's First-Ever Endowment Programs

The R. Harold and Patsy Harrison Foundation has generously provided funding to endow two programs in support of the Georgia Tech Research Institute's Agricultural Technology Research Program (ATRP). The commitment establishes the brand new R. Harold and Patsy Harrison Research Faculty Fellowship to support early career research faculty. In addition, the Foundation chose to support student engagement in poultry technology research through ATRP's Abit Massey Student Internship Program.

ATRP works closely with Georgia's poultry industry to develop new technologies and adapt existing ones for specialized industrial needs. These innovations are designed to maximize productivity and efficiency, advance safety and health, and minimize environmental impact. Research activities focus on four core areas: advanced imaging and sensor concepts, robotics and automation systems, environmental and energy systems, and food safety technologies.

The R. Harold and Patsy Harrison Research Faculty Fellowship Endowment will help ATRP attract and retain early career research faculty in engineering and science who might not consider poultry technology research as a career option. The Abit Massey Student Internship

Program provides undergraduate students an opportunity to work alongside ATRP researchers on real-world challenges facing poultry production and processing.

The R. Harold and Patsy Harrison Foundation commitment provides foundation for a broader fundraising effort to further support the Abit Massey Student Internship Program and other research programs within ATRP.

To inquire about making a gift, contact Ricardo Hubler at ricardo.hubler@dev.gatech.edu or 404-894-6007.

"The entire ATRP team is grateful for the Harrison Foundation and their generosity in creating the program's first-ever endowment. This gift will support the students and faculty researchers as they pursue transformational research and development for Georgia's poultry industry for years to come," says Dr. Doug Britton, ATRP program manager.

"We sincerely hope that all of our friends and industry partners will join us by contributing to the Abit Massey Student Internship Program, which honors our good friend and a living legend in the Georgia poultry industry."

as a stimulus for Georgia Tech faculty and students to produce significant advances in innovation and technology.

She also spoke of her family's longtime friendship with Abit Massey, president emeritus of the Georgia Poultry Federation, and the Foundation's desire to recognize Massey's lifetime of contributions to the poultry industry. "Simply put, Abit is the ideal person to inspire the best and brightest that Georgia Tech will bring to the student internship program that bears his name," said Reynolds. ♥

Bobbie Ann Harrison Reynolds and her family attended ATRP's annual Research Open House on January 29, 2020, at the Food Processing Technology Building on Georgia Tech's campus. During the announcement ceremony, she spoke of her late parents' commitment to supporting education and the Foundation's work to continue that legacy. The new endowment honors them. Her father founded Harrison Poultry in 1958 in Bethlehem, Georgia.

Reynolds expressed her desire that the endowment and the resources it creates in perpetuity will serve



Pictured L-R: Dr. Doug Britton, ATRP program manager; Dr. Jim Hudgens, GTRI director; Mike Giles, Georgia Poultry Federation president; Abit Massey, Georgia Poultry Federation president emeritus; David Bleth, Harrison Poultry president and CEO; Bobbie Ann Harrison Reynolds; Raymond Reynolds; and Graham Reynolds.

RESEARCHER PROFILE

Michael Park



Job title: Research Engineer

Education: B.S., Electrical and Computer Engineering, The University of Texas at Austin

Areas of research expertise: Robotics, Motion Planning, Controls, Machine Learning, Computer Vision

List of any poultry industry projects you're working on and your role: Intelligent Cutting (Robotics), Cone Loading (Robotics), Gait Scoring (Computer Vision)

What I find most rewarding about working on poultry industry projects: Learning different aspects of the poultry industry and improving them through enabling a new technology

A talent I wish I had: Teleportation

Another occupation I'd like to try: Soccer coach

My first job: Math tutor

If I could meet someone famous, who would it be and why: Bernard Werber – I want to ask him where he gets the ideas for his books

One thing people may not know about me: I have never been to Europe

My day would not be complete without: YouTube

The last book I read: Will you be there? by Guillaume Musso

The last movie I saw: X-Men: Dark Phoenix

My favorite song: None. I have a broad taste in music; these days I mainly listen to Lo-fi Hip-Hop or Bossa Nova

My motto: "Good fortune often happens when opportunity meets with preparation." – Thomas Edison

My hobbies: Cooking, watching videos, exploring new restaurants

Abit Massey Student Internship Program Inspires Next Generation of Technology Experts

The Abit Massey Student Internship Program provides annual support for a Georgia Tech student to gain unique knowledge and experience in the Georgia Tech Research Institute's Agricultural Technology Research Program (ATRP). The undergrad works alongside a research mentor on projects in the areas of robotics, sustainable systems, food safety, and/or advanced sensing technologies. The goal is to prepare the next generation of researchers and professionals to innovatively tackle the challenges of building the poultry plant of the future. The program honors Massey, president emeritus of the Georgia Poultry Federation, who was instrumental in ATRP's founding more than 45 years ago and remains a dedicated supporter to this day.

PoultryTech recently asked the first recipient of the Abit Massey Student Internship award, Louise Zhuang, to share her thoughts on the experience. Zhuang interned with the program in 2019-2020. A native of Bishop, Georgia, she completed her matriculation at Tech in May 2020, earning a Bachelor's degree in Electrical Engineering. A recipient of a National Science Foundation (NSF) Graduate Research Fellowship, Zhuang plans to continue her education by pursuing a Ph.D. in Electrical Engineering at Stanford University.

Q: PoultryTech – What project(s) did you work on and your role?

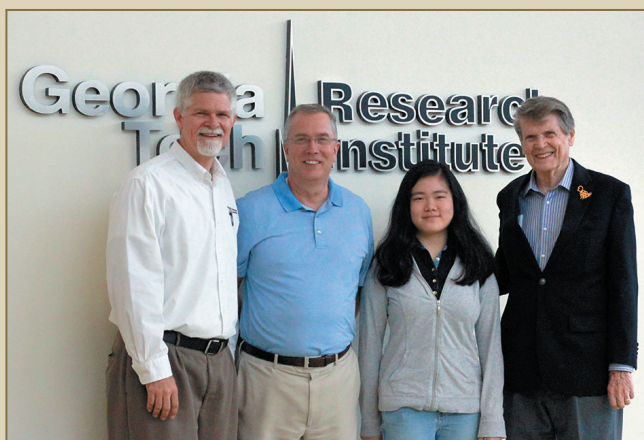
A: Zhuang – I worked on the Virtual Reality (VR) Cutting Trajectories and the Growout House Audio Monitoring projects. For the VR project, I mostly worked on developing trajectory models for generating paths for automated poultry deboning. This involved a few different aspects: working with CT and MRI scans of chickens so we could create an accurate 3D depiction of bones, key soft tissues, and external body structures for simulations and anatomical analysis; using and improving upon a VR simulation environment where we develop, test, and display trajectory models with those 3D chickens; and assisting with testing models in real life on a robotic arm with actual chicken carcasses. For the audio monitoring project, I worked on developing and testing different algorithms for characterizing audio from chicken houses to flag when irregularities, such as disease or high temperature, occur.

Q: PoultryTech – What knowledge and skills did you gain and how do you plan on applying them in the future?

A: Zhuang – I've learned a lot through my work here. I've become more experienced with software development, especially for more complex projects, and creating algorithms for processing large amounts of audio data. I've also become much more knowledgeable about scripting in Unity for VR, analyzing anatomical features in CT and MRI scans, and working with coordinate frame transformations.

I definitely believe all the software skills I've developed will be useful to me in the future since I'll be doing more coding and algorithm development in graduate

school and beyond. I'm sure I'll also encounter work in interdisciplinary areas like medical imaging or robotics, so what I've learned here will provide a good foundation for future work.



Pictured L-R: Dr. Doug Britton, ATRP program manager; Mike Giles, Georgia Poultry Federation president; Louise Zhuang, Abit Massey Student Internship recipient; Abit Massey, Georgia Poultry Federation president emeritus.

Q: PoultryTech – What was the best part of your internship experience?

A: Zhuang – I enjoyed working with the many interdisciplinary aspects of the cutting trajectories project. Being able to see all the trajectory development work come together with real-life deboning cuts on a robotic arm was pretty satisfying. Plus, presenting this work at a conference in Montreal was also a great experience!

Editor's Note: Zhuang participated in the Poultry Science Association Annual Meeting, held in July 2019 in Montreal, Canada. She delivered a presentation on her research activities as part of the student symposium competition. Several hundred student abstracts were submitted, mostly by graduate students. Zhuang was awarded the Certificate of Excellence for Oral Presentation in the Processing and Products category. This is one of just eight certificates awarded to all student contestants.

Q: PoultryTech – Did the internship provide you with any insights that you hadn't anticipated?

A: Zhuang – When I first started out, I honestly wasn't super familiar with VR and didn't realize all its capabilities. The power of VR in displaying environments in a very immersing way and its ability to facilitate collaborations and demonstrations is really unique. I didn't initially anticipate how large of a role it would play in my work here and how it could make big impacts in other application areas in the future.

Q: PoultryTech – What advice would you give to students who may intern with the program in the future?

A: Zhuang – 1) If there's something that you want to work on or do, whether it's trying something new with your project, presenting at an expo or conference, or even putting in an NSF GRFP application, go for it. People here are really supportive and knowledgeable.

2) Don't be too afraid to try something new. Sometimes you'll find something that you didn't know you'd like, and even in the worst-case scenario that you don't enjoy it, at least you'll know more about yourself.

Q: PoultryTech – What are your future career goals?

A: Zhuang – I want to work on research that is interdisciplinary, especially something that weaves electrical engineering, computer science, and biology together (such as biological imaging analysis or visualization). I'm considering a couple options right now on research paths to take, but luckily I'll have several years of graduate school over which I can make a more absolute decision on my career. ♥

SAVE THE DATE



August 10-12, 2020

**Hilton Sandestin Beach Golf Resort & Spa
Destin, Florida**

The 2020 National Safety Conference for the Poultry Industry is designed specifically for poultry facility and corporate safety personnel. The three-day event features key presentations on important industry topics and updates on government policy. Other highlights include breakout sessions for discussing best practices and current challenges, as well as networking and knowledge exchange opportunities with other safety and health professionals.

To register, visit uspoultry.org/educationprograms

International Food Automation Networking (IFAN) Conference Announces New Dates

Due to COVID-19 concerns, the International Food Automation Networking (IFAN) Conference has been rescheduled for December 13-15, 2020, at the Georgia Tech Hotel and Conference Center in Atlanta, Georgia. The organizing committee's goal is to provide a quality education and networking experience while maintaining the safety and health of all parties involved.

This biennial conference brings together industry professionals from around the globe. The 2018 conference drew more than 80 participants representing food processors, equipment manufacturers, and industry and university researchers from six European countries, the United States, and Australia.

IFAN Conference 2020 will focus on robotics and automation in the food industry and examine new technology trends, industry challenges, and evolving research. Do not miss the opportunity to hear from industry experts covering topics in key focus areas, all of which have implications for shaping the food system of the future, including:

- Food Safety Regulations
- Food Production and Environmental Impacts
- Food Industry Automation
- Collaborative Robotic Work Cells
- Intelligent Sensing and Vision Grading

Mark your calendars and register early to join your fellow industry professionals for engaging and thought-provoking presentations and discussions.

Registration opens July 1, 2020. Register at ifan.gtri.gatech.edu

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