W Newsletter

Letter From the Chair

Dear Friends of the WMU Department of Statistics:

Time goes quickly, and we realized that we have not published our departmental newsletter since 2015! My apologies and a promise that we will try hard to do better.

Many things have changed since 2015. WMU has a new President and a new Provost, and the College has a new Dean. We are looking forward to the changes. Our new administrators have a lot of energy, determination and a great vision. President Edward G. Montgomery wants WMU to become the third research university in the state of Michigan, one of the big three together with the University of Michigan, and Michigan State University. Faculty and students in the Department of Statistics really like the idea because it means more opportunities for us, as statistics has to be an important component of most quantitative research initiatives. Everybody is talking about the importance of big data and the Department of Statistics is becoming seen as the core. It is an exciting time for us.

With the discipline becoming more and more dependent on fast statistical computing to be ready for big data challenges and opportunities, the department is changing also. The prevalent research interest in nonparametric and robust methodology had to make room for increasing interest in novel methodology for analysis of large and complex sets of data. The department already has two junior faculty members with an interest in big data – Dr. Kevin Lee and Dr. Hyun Bin Kang – both graduates of The Pennsylvania State University. We hope that even more faculty with the expertise in big data methodology will join the department in the near future. As big data appear in so many areas of life today, we need to hear from our alumni and have their support. Our last two recipients of the Alumni Achievement Award: Dr. Chad Schafer from the Department of Statistics at Carnegie Mellon University (2015) and Toby Hall – a Senior Vice President and Chief Actuary of the Delta Dental of Michigan (2017) both work with big data, although in two different settings (see more details inside). Perhaps the time has come to create an advisory board for the department, so stay tuned.

With the help of Dr. Lee, in 2017 our department became a NISS (National Institute of Statistical Sciences) affiliate and it opened several new opportunities for our faculty and students. NISS conducts research in areas such as bioinformatics, data confidentiality, data integration, data quality, information technology, environment, and education statistics. The organization provides workshops, short courses, and programs for postdoctoral fellows and visitors.

Our students in Statistics and Data Science programs are excited about the big data challenges. They formed a Data Science and Statistics Club, and two years in a row represented the department in the DataFest competition at Loyola University in Chicago. Both years our team returned to Kalamazoo with awards: for the best data insight in 2017

and for the best graphical data presentation in 2018. The club's past president (Jason Hernacki) and member of both DataFest winning teams, and recently was awarded a scholarship to attend La Serena School of Data Science 2018 in Chile.

The number of our majors is increasing, and the trend is continuing. Our undergraduate program in Data Science already took off and this fall our MS in Data Science program will start. We already accepted 12 students to the program and are looking forward to welcoming them at the end of August. These programs were the first Data Science programs in Michigan when they were proposed.

With all these good things happening also come challenges. More students means less scholarship money for qualifying ones and fewer internship opportunities for interested graduate students. Therefore, please help us if you can. Any contributions to the scholarship funds would be welcomed and highly appreciated. Please contact Michelle Hastings at 269-387-1421 or michelle.hastings@wmich.edu. We also would be very interested in any summer internships in the companies that our alumni are working for. Please let us know of existing openings and we

will forward the information to students who might then apply.

Please check the Facebook account on our departmental website—Dr. Naranjo keeps it current. As always let us know if you would like to visit, give a talk or just have a chat. We would be happy to see you and hear what you think about our programs, how we could do an even better job preparing our students for their statistical careers.

And last but not least – this fall, after being the department chair for 10 years, I was granted a sabbatical leave for one semester. The dean appointed Dr. Joseph McKean as the acting department chair. Congratulations Joe and thank you for accepting this position. We are all grateful!

With best regards,
Dr. Magdalena Niewiadomska-Bugaj

Scholarship Fund Gifted

This summer the Department of Statistics received an extraordinary gift from Mr. and Mrs. Mark Becker.

The Beckers donated $10,000 and asked that it be added to the James H. Powell Scholarship fund. This endowment was created to honor Dr. Powell, a late professor in the department of Mathematics and Statistics, a former leader in the area of statistics, department chair, and an associate dean of the College of Arts and Sciences.

The award was established to recognize outstanding undergraduate students majoring in statistics.

Thank you very much Mr. and Mrs. Becker!

Alumni Achievement Awards

The Department of Statistics is pleased to announce the latest Alumni Achievement award recipients!

Dr. Chad Schafer ('95) was named the 2015 Distinguished Alumni recipient. He is an associate professor in the Department of Statistics at Carnegie Mellon University, Pittsburgh.

Dr. Schafer's research focuses primarily on the development and implementation of statistical methods to address problems in astronomy, a field increasingly faced with complex big data challenges.

From left: Dr. Joseph McKean, Dr. Chad Schafer ('95), Dr. Magdalena Niewiadomska-Bugaj, and College of Arts and Sciences Interim Dean Dr. Keith Hearrit.

He is the principle investigator for funding and grants from the NSF and NASA. His work has been published in, among others, the "Journal of American Statistical Association," "Annual of Applied Statistics," "Astrophysical Journal," "Annual Reviews of Statistics and Its Application." He is also co-chair of the Informatics and Statistics Science Collaboration for the Large Synoptic Survey Telescope (LSST). This group works to increase the involvement of data scientists in addressing the challenges faced when they are confronted with the massive amount of data that LSST will gather. Schafer was co-chair for the 2016 Statistical Challenges in Modern Astronomy VI conference, at Carnegie Mellon University.

Dr. Schafer also is an associate editor for the "Journal of the American Statistical Association." He has served in various leadership roles for the American Statistical Association, including president for the Pittsburg chapter, and as a member of the executive boards for the Section on Nonparametrics and Section on Statistics Education.

Dr. Shafer is the Director of Graduate Studies for the Department of Statistics as well as director of the Summer Undergraduate Research Experience. He teaches for the department's highly-ranked M.S. in Computational Finance.

The 2017 Alumni Achievement Award recipient was **Toby Hall** ('97). Hall graduated from WMU with a B.S. in Statistics and a minor in mathematics. While at WMU, he earned the James H. Powell Award for outstanding statistics student.

Toby Hall ('97), with Dean of the College of Arts and Sciences, Dr. Carla Koretsky, and Dr. Joshua Naranjo

He completed his MBA from The University of Michigan Stephen M. Ross School of Business in 2006, while working full time as an actuary. Early in his career, Hall was a college and high school math teacher, a SAS programmer, and an actuarial consultant for Deloitte and Touche, LLP. In 2003, he was hired as associate actuary at Delta Dental of Michigan. After five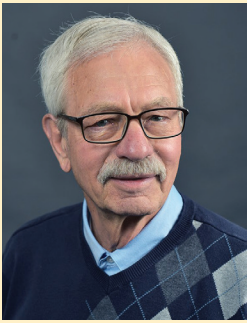 years, he was promoted to director and chief actuary, and served as appointed actuary for several companies. Hall currently serves as senior vice president, chief actuary, and chief data officer and has responsibility for the actuarial, underwriting, and competitive intelligence departments.

While at Delta Dental, Hall has also led several major company-wide initiatives including implementation of the Affordable Care Act, a claims system re-write, and adoption of a formal data governance program. Hall remains active in the areas of actuarial education. He has served on committees responsible for planning, writing and grading actuarial credentialing examinations.

The 2018 recipient, **Mr. Loren Heun**, graduated with an M.S. in Statistics in 1972. He then joined the Upjohn Company, in Kalamazoo, where he worked as a programmer and information scientist, supporting the drug development processes until his retirement in 2000.

After retirement, he joined the Department of Statistics, at WMU, to work as a coordinator of a 14-section course STAT 2160 – Business Statistics, which is a required course for all pre-business students.

Heun has done excellent work as a STAT 2160 course coordinator. He developed course materials, helped with programming a computer system that does automatic generation of random and grading of assignments, developed for on-line sections. In addition, he trained and monitored teaching assistants who were teaching the sections under his supervision.

He is always interested in novel research on teaching introductory statistics. He searches for interesting publications, tries new ideas, was first to introduce new technology in the classroom and advocated for using it in other introductory statistics courses.

His enthusiasm for the possibilities of even better solutions is unparalleled. There have been more than 20,000 students in the Business Statistics class at WMU, over some 15 years who have had their statistical knowledge shaped by Mr. Heun. It is never an easy grade or a hard-to-understand algebraic manipulation, but a well-structured delivery of how one could get the correct information from the data most efficiently.

Thank you Mr. Heun, for all your years of hard work:For helping us teach a course that the Department of Statistics is very proud of; and for inspiring us to reach for novel solutions to teaching statistics, especially to non-majors.

Statistics Senior Invited to Join Phi Beta Kappa

Senior **Brittany Hall** was invited to join the WMU Chapter of Phi Beta Kappa. Phi Beta Kappa is the oldest academic honor society in the United States, founded in 1776. Brittany was named the Presidential Scholar in 2017 and was inducted into Phi Beta Kappa in 2018.

Each year, 1/100 students, nationwide, are invited to join, making Phi Beta Kappa one of the most selective and prestigious associations in the nation. Fewer than 15 percent of U.S. colleges and universities have been granted a chapter. Invitations to join Phi Beta Kappa are only extended to outstanding students who are in the top 10 percent of their class and who demonstrate a commitment to the liberal arts and sciences and to freedom of inquiry and expression. Membership in Phi Beta Kappa is for life.

Her interest in real-world statistics began in 2014, when she used her limited knowledge of the discipline to help her community resist plans to build a gas station adjacent to a neighborhood preschool. She collected data on opinions regarding zoning of that location before organizing and presenting the findings to the City of Portage. The efforts put forth by Brittany and her community resulted in a more mutually beneficial zoning decision for that property,

which is now the site of a memory care facility.

Since then, Brittany has been passionate about using statistics to improve the world. While at WMU, Brittany worked as an office assistant in the Departments of Statistics and Mathematics before becoming a statistics Graduate Assistant in 2018. Most of her personal time is spent with her family and her daughter has been her primary motivation to succeed.

Brittany is a graduate of Portage Central High School in Portage, Mich. and obtained an A.A. in Computer Science at Kalamazoo Valley Community College. She enrolled at Western Michigan University in 2016 and completed the Accelerated Degree Program with a B.S. in Statistics in 2017, *summa cum laude*. She will graduate with her M.S. in Statistics in December 2018.

Jason Hernacki Named 2018 Presidential Scholar

2018 Presidential Scholar Jason Hernacki accepting his award from Suzan Ayers, past Faculty Senate president, and WMU President Edward Montgomery.
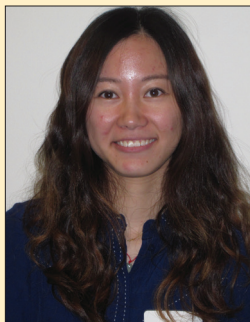
Jason Hernacki has been named the 2018 Presidential Scholar for the Department of Statistics. Hernacki is in the Accelerated Master's in Statistics program and hails from Fenton, Mich. He has minors in Computer Science and Mathematics with a focus on Machine Learning/ Data Science. He is a two-time winner at Chicago Loyola Datafest, Founder of the Data Science and Statistics Club, and president of the Academic Computing Society, founding father and former Treasurer of Theta Chi Fraternity, and more.

Hernacki has been awarded multiple scholarships including the Fred A. Beeler Memorial Scholarship, Sherwood and Janet Roberts Blue Memorial Scholarship and a full scholarship to La Serena School of Data Science in Chile. In addition, he is doing active research on topics such as deep learning, text mining, and network analysis.

Research and Creative Activities Poster Day Winner Jenny Shen
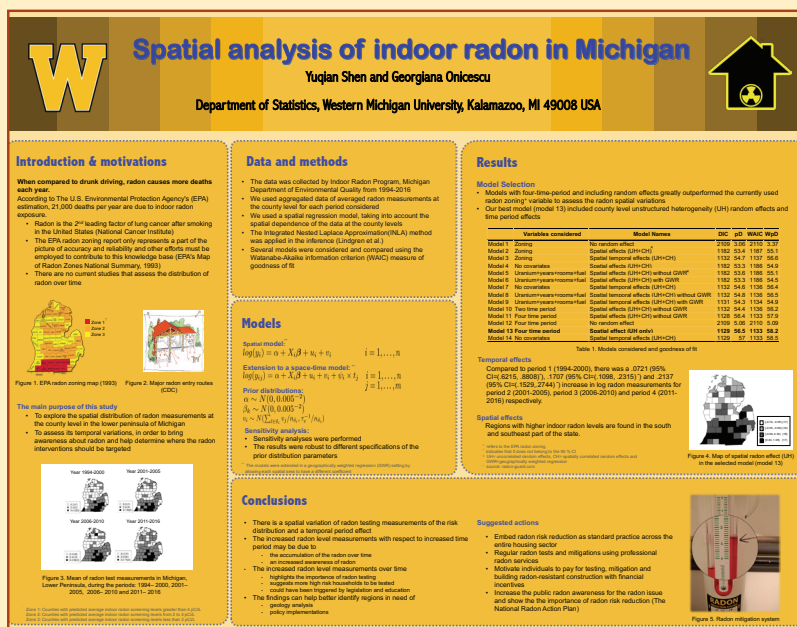

Yuqian Shen (Jenny) had her poster, "Spatial Analysis of Indoor Radon in Michigan" selected as an "Outstanding Poster Presentation" during the WMU University Research and Creative Activities Poster Day in April 2018.

The study explored the spatial distribution of radon testing patterns at the county level, in the lower peninsula of Michigan, and assessed its temporal variations.

The purpose of the project was to create awareness about radon and determine where radon interventions should be targeted.

Jenny is from Shanghai, China and is a third-year Ph.D. student. She works as a research assistant under the supervision of Dr. Georgiana Onicescu. Her dissertation is on the model selection of spatial data research.

New Faculty

Dr. Kevin H. Lee, joined the Department of Statistics at Western Michigan University in August 2017 as an Assistant Professor. He completed his Ph.D. in Statistics at The Pennsylvania State University in 2017 and both his Master's degree in Statistics and Bachelor's degrees in Statistics and Financial Engineering at Korea University, Seoul, the Republic of Korea.

Dr. Lee's main research interests include: developing statistical models and learning complex structures in large-scale dynamic networks; inferring heterogeneous conditional dependencies of high-dimensional data; and variational inference to solve computationally intensive problems which commonly appear in modern statistics.

He believes that in the near future, there will be more needs in statistical models handling ultra large-scale networks and ultra high-dimensional data. Therefore, his long-term goal of research is to develop practical and scalable models to explore and learn such data and collaborate with industry in developing solutions for more practical problems.

Dr. Lee is a recipient of the Brumbach Distinguished Graduate Fellowship and Academic Computing Fellowship, a prestigious award that involves a university-wide competition. He also won several conference student paper awards including JSM Student Paper Award in Statistical Learning and Data Science and ICSA Student Paper Award.

In his free time he watches movies and plays racquetball. He loves coffee, good food, travel, and watching musicals. He is looking forward to seeing more musicals at Miller Auditorium in the near future.

Dr. Hyun Bin Kang completed her Ph.D. in Statistics at The Pennsylvania State University in 2018 and received a B.S., *magna cum laude*, in Statistics and Mathematical Economic Analysis with a minor in Financial Computation and Modeling from Rice University in 2012.
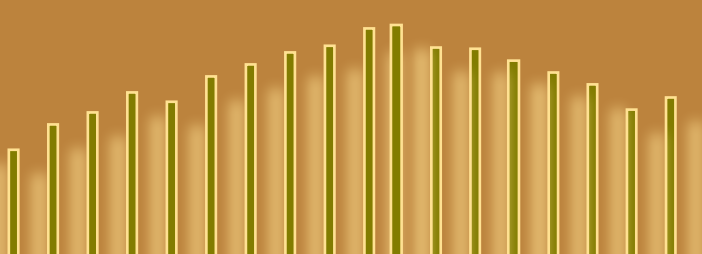
Her research interests lie in developing new methodologies to deal with large, complex, and structured data using Functional Data Analysis (FDA) techniques. FDA is a rapidly developing area of statistics for samples of functions, trajectories, surfaces, images, or shapes. It has been extensively used in a variety of fields including geoscience, health studies, kinesiology, and finance to name only a few.

As a part of the recent movement of developing next generation functional data methods, which are designed for more complicated functional objects, Dr. Kang established the framework of Functional Manifold Data Analysis (FMDA) where each statistical unit is a manifold. Such data is increasingly common in biomedical imaging, engineering, and anthropology. Her current work focuses on understanding how variables such as sex, age, height, and weight along with millions of genetic information influence the 3D shape of human face. New methodologies are needed to reveal the relationship between such high-dimensional covariates and complicated structure of facial shape. She attended the CBMS conference on Elastic Functional and Shape Data Analysis (EFSDA) this summer.

Dr. Kang is a receipeint of university-wide fellowships including Brumbach Distinguished Graduate Fellowship, Jack and Eleanor Pettit Scholarship in Science, and Academic Computing Fellowship. She also received an Award for Excellence in Online Instruction in 2016. During her undergraduate years, she received L. J. Walsh Scholarship in Engineering.

Dr. Kang enjoys reading books, watching movies, and going to musicals. She also loves travel and visiting new places in the world. Last year she visited Hokkaido, Japan.

Faculty Specialists

Dr. Nichole Andrews, STAT 2160 coordinator, earned her bachelor's degree from Grand Valley State University in 2010 with a major in secondary mathematics education and minors in both psychology and statistics. The following school year, Nichole worked as a high school math teacher for Shelby Public Schools in Michigan, teaching various levels of mathematics. Following her year of teaching, she started her M.S. in Statistics at Western Michigan University and also continued working at Grand Valley State University as a visiting professor.

Nichole completed her master's degree in 2013. She immediately began working on her Ph.D. at Western Michigan University.

During her first year (2013-14), she worked as a teaching assistant, earning the Best TA Award in the department. Nichole was then offered the position of Faculty Specialist with the responsibility of being in charge of a multi-section introductory course. She has held this position at WMU since 2014.

After writing her dissertation on growth curve models and personalized treatments, Nichole earned her Ph.D. in the spring of 2017. Dr. Andrews currently has one published article in the "Statistics in Medicine" journal with another in the process of being published in the "The Journal of the Korean Statistical Society."

Dr. Carrie McKean, STAT3660 coordinator, received her Ph.D. in Biological Sciences and a Graduate Certificate in Applied Statistics in 2014 from WMU. Her research focused on analysis of data from the National Health and Nutrition Examination Survey as she investigated various health effects as correlated with body burden of organophosphate metabolites.
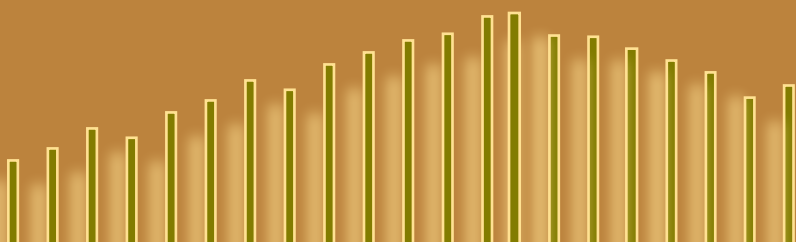
Following graduation she taught as visiting professor at Grand Valley State University in the biomedical sciences. She has been a Faculty Specialist at WMU since August 2016. She is the STAT3660 coordinator, and is teaching Pathophysiology for the Department of Physician Assistants at WMU in fall 2018. She is interested in research involving data analysis with biological or medical based datasets.

Ian Kapenga, STAT 1600 coordinator, has completed his B.A. and M.A. in Philosophy and most recently earned an M.S. in Statistics, (summa cum laude) and a graduate certificate in Biostatistcs from WMU. His current goal is to pursue a Ph.D. He is interested in statistica methodology for large data like those in astronomy or genomics.

Throughout his time at WMU, Kapenga has earned multiple academic awards including the Dr. Gerald Sievers Scholarship, a Graduate Travel Grant, the Robert Friedmann Philosophy Prize, and was named a WMU Presidential Scholar for his undergraduate studies in philosophy.

Working with the Graduate Student Association of Philosophers, Kapenga was responsible for securing funds for the internaitonally recognized 7th Annual Graduate Philosphy conference at WMU.

2017-18 Student Achievement Awards

Front row, from left: Colloquium Awards: Jenny Shen and Ida Alcantara; Teaching Excellence Award: Eunice Ampah; Sievers Memorial Scholarship Award: Joseph Billian; Teaching Excellence Award: Bang Le. Center row: Dr. Joseph McKean; Mr. Loren Heun, Statistics Teaching Excellence Awards: Stacy Prieur, Qihai Liu. Back row: Statistics Teaching Excellence Award: Brandon Addicott, Dr. Joshua Naranjo.

Relaxing at the 2017 Statistics Welcoming BBQ celebration. Pictured are (from left): Dr. Joshua Naranjo, John Murphy-statistics graduate student, Dr. Hyun Bin Kang, and Dr. Kevin Lee—all with new department t-shirts.

2018 DataFest Participents (from left): Ian Kapenga, Zac Buchalski, Zakarie Hashi, Jacob Darling, Jason Hernacki, Dr. Kevin Lee. Missing: Brandon Addicott, Axel Illesca.

On the web at:
www.wmich.edu/statistics

New for 2018-19 M.S. in Data Science

Undergraduate Major in Data Science
Requirements:
- Math core (eight hours)
- Computer science core (15 hours)
- Statistics core (16 hours)
- Two electives (6 hours)
- Other requirements: Writing Course: CS 4900/4910.

Minor in Data Science
Requirements:
- STAT 2600: Statistics Using R (4 cr.)
- STAT 4640: Intro to Stat. Computing (3 cr.)
- Three electives (nine hours)
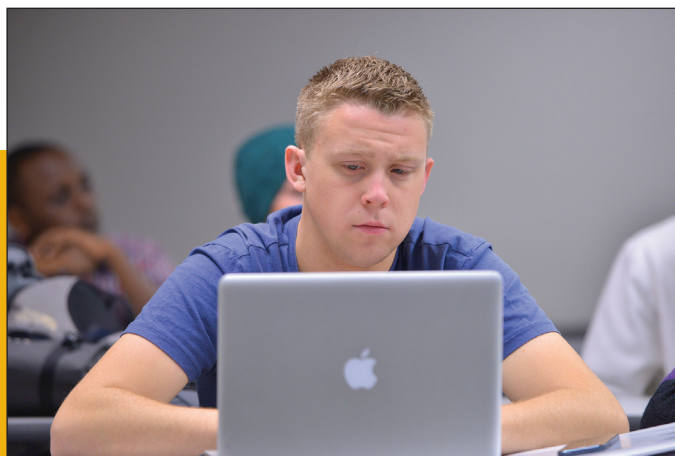- An approved quantitative research course from student's home department

NEW!
M.S. in Data Science
Offered jointly by the Department of Statistics and the Department of Computer Science Entrance requirements: Linear Algebra, Calculus I-III, course in statistical methods, course in probability (post Calculus), introduction to R software, a strong background in an object oriented programing language such as Java or C++.

This is an interdisciplinary master's program offered by the departments of Computer Science (CEAS) and Statistics (COAS). Half of the coursework for the degree consists of graduate courses in computer science while the other half consists of graduate courses in statistics.

To suppot this program by donating online, go to: **http://bit.ly/GIVE2STATISTICS**.

The amount of data in our world has been exploding, and analyzing large data sets—so-called big data—will become a key basis of competition, underpinning new waves of productivity growth, innovation, and consumer surplus, according to research by MGI and McKinsey's Business Technology Office.

Leaders in every sector will have to grapple with the implications of big data, not just a few data-oriented managers. The increasing volume and detail of information captured by enterprises, the rise of multimedia, social media, and the Internet of Things will fuel exponential growth in data for the foreseeable future.

The career options for statisticians are endless, and the job market continues to grow: the Bureau of Labor Statistics expects the need for data scientists to increase 30 percent by 2024.

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https://www.facebook.com/WMUStatistics

Want to help more students graduate from the Department of Statistics?

In a time when state funding is increasingly restricted, the support we receive from friends and alumni is vitally important. Such funds are used to take advantage of new or unbudgeted opportunities in order to enhance the teaching or the research of the department, or to assist students in achieving their educational and professional goals.

Any contributions to the scholarship funds are highly appreciated.
- Fred A. Beeler Memorial Scholarship Fund
- Clarke Statistics Fund
- Arthur E. and Martha S Hearron Student Faculty Enrichment and Scholarship Endownment
- Data Science Fund Scholarship
- Dr. Gerald L. Sievers Memorial Award
- James H. Powell Award in Statistics

Thank you for considering a gift to the WMU Department of Statistics.

To become a donor online, go to:
http://bit.ly/GIVE2STATISTICS

Or send your paper check of any amount to:
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Kalamazoo, MI 49008-5152
www.wmich.edu/statistics

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Thank you to our Donors!

- Mr. and Mrs. Mark Becker
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