

CONTACT  
INFORMATION

239B Kildee Hall  
Iowa State University  
Ames, Iowa 50011 USA

*E-mail:* hpyu@iastate.edu  
*Phone:* (701) 730-1368  
*WWW:* [haipengu.github.io](http://haipengu.github.io)

RESEARCH  
INTERESTS

My overarching research focus is to understand the genotype-phenotype map in animals and plants using computational and statistical genetics. Particularly, I am seeking to develop and apply statistical and computational methods to the whole-genome prediction of complex traits, genome-wide association analysis, and image-derived high-throughput phenotyping data analysis.

## EDUCATION

**Virginia Polytechnic Institute and State University**, Blacksburg, Virginia USA

Ph.D., Animal and Poultry Sciences - Quantitative Genetics, May 2020

- Dissertation: "Designing and modeling high-throughput phenotyping data in quantitative genetics" [[Virginia Tech Libraries](#)]
- Advisor: Dr. Gota Morota

**North Dakota State University**, Fargo, North Dakota USA

M.S., Animal Sciences - Animal Breeding and Genetics, August 2016

- Thesis: "The exploration of a four-platform standing scale in the application of measuring temperament in beef cattle"
- Advisor: Dr. Lauren Hulsman Hanna

**Qingdao Agricultural University**, Qingdao, Shandong CHINA

B.S., Veterinary Medicine, July 2013

PROFESSIONAL  
POSITIONS

**Iowa State University**, Ames, Iowa USA

Post-doctoral Fellow

**08/2020 - Present**

- Advisor: Dr. Jack Dekkers

WORK  
EXPERIENCE

Department of Animal and Poultry Sciences

**Virginia Polytechnic Institute and State University**, Blacksburg, Virginia USA

- Graduate Research Assistant **08/2018 - 05/2020**
- Graduate Teaching Assistant **Spring 2019 and Spring 2020**

Department of Animal Science

**University of Nebraska-Lincoln**, Lincoln, Nebraska USA

- Graduate Research Assistant **08/2016 - 08/2018**

Department of Animal Sciences

**North Dakota State University**, Fargo, North Dakota USA

	<ul style="list-style-type: none"> <li>• Graduate Teaching Assistant</li> </ul>	08/2015 - 05/2016
	<ul style="list-style-type: none"> <li>• Graduate Research Assistant</li> </ul>	01/2015 - 05/2016
PROFESSIONAL SOCIETY MEMBERSHIPS	<ul style="list-style-type: none"> <li>• American Dairy Science Association. 2021 - Present</li> <li>• American Society of Animal Science. 2017 - Present</li> </ul>	
EDITORIAL ACTIVITIES	<p><u>Reviewed for</u></p> <ul style="list-style-type: none"> <li>• Scientific Reports (1)</li> </ul>	
PREPRINTS	<p>12. Campbell M, <u>Yu H</u>, Momen M, and Morota G. Examining the relationships between phenotypic plasticity and local environments with genomic structural equation models. <i>bioRxiv</i>. doi: <a href="https://doi.org/10.1101/2019.12.11.873257">10.1101/2019.12.11.873257</a></p>	
PEER REVIEWED JOURNAL PAPERS	6 first author and 5 co-author	
2021	<p>11. Clevinger EM, Biyashev R, Lerch-Olson E, <u>Yu H</u>, Quigley C, Song Q, Dorrance AE, Robertson AE, and Maroof S. Identification of Quantitative Disease Resistance Loci towards Four Pythium Species in Soybean. <i>Frontiers in Plant Science</i>. doi: <a href="https://doi.org/10.3389/fpls.2021.644746">10.3389/fpls.2021.644746</a></p> <p>10. Pegolo S, <u>Yu H</u>, Morota G, Bisutti V, Rosa GJM, Bittante G, and Cecchinato A. Structural equation modelling for unravelling the multivariate genomic architecture of milk proteins in dairy cattle. <i>Journal of Dairy Science</i>. Early view. doi: <a href="https://doi.org/10.3168/jds.2020-18321">10.3168/jds.2020-18321</a></p> <p>9. <u>Yu H</u> and Morota G. GCA: An R package for genetic connectedness analysis using pedigree and genomic data. <i>BMC Genomics</i>. <b>22</b>:119. doi: <a href="https://doi.org/10.1186/s12864-021-07414-7">10.1186/s12864-021-07414-7</a></p> <p>8. <u>Yu H</u>, Lee K, and Morota G. Forecasting dynamic body weight of non-restrained pigs from images using an RGB-D sensor camera. <i>Translational Animal Science</i>. <b>5</b>:1-9. doi: <a href="https://doi.org/10.1093/tas/txab006">10.1093/tas/txab006</a></p> <p>7. Momen M, Bhatta M, Hussain W, <u>Yu H</u>, and Morota G. Modeling multiple phenotypes in wheat using data-driven genomic exploratory factor analysis and Bayesian network learning. <i>Plant Direct</i>. <b>00</b>:e00304. doi: <a href="https://doi.org/10.1002/pld3.304">10.1002/pld3.304</a></p>	
2020	<p>6. Amorim ST, <u>Yu H</u>, Momen M, de Albuquerque, LG, Pereira, ASC, Baldi F, and Morota G. An assessment of genomic connectedness measures in Nellore cattle. <i>Journal of Animal Science</i>. <b>98</b>:1-12. doi: <a href="https://doi.org/10.1093/jas/skaa289">10.1093/jas/skaa289</a></p>	

5. **Yu H**, Morota G, Celestino EF, Dahlen CR, Wagner SA, Riley DG, and Hanna LLH. Deciphering cattle temperament measures derived from a four-platform standing scale using genetic factor analytic modeling. *Frontiers in Genetics*. **11**:599. doi: [10.3389/fgene.2020.00599](https://doi.org/10.3389/fgene.2020.00599)
- 2019
4. Hanna LLH, Hieber JK, **Yu H**, Celestino Jr EF, Dahlen CR, Wagner SA, and Riley DG. 2019. Blood collection has negligible impact on scoring temperament in Angus-based weaned calves. *Livestock Science*. **230**:103835. doi: [10.1016/j.livsci.2019.103835](https://doi.org/10.1016/j.livsci.2019.103835)
  3. **Yu H**, Campbell MT, Zhang Q, Walia H, and Morota G. 2019. Genomic Bayesian confirmatory factor analysis and Bayesian network to characterize a wide spectrum of rice phenotypes. *G3: Genes, Genomes, Genetics*. **9**:1975-1986. doi: [10.1534/g3.119.400154](https://doi.org/10.1534/g3.119.400154)
- 2018
2. **Yu H**, Spangler ML, Lewis RM, and Morota G. 2018. Do stronger measures of genomic connectedness enhance prediction accuracies across management units? *Journal of Animal Science*. **96**:4490-4500. doi: [10.1093/jas/sky316](https://doi.org/10.1093/jas/sky316)
- 2017
1. **Yu H**, Spangler ML, Lewis RM, and Morota G. 2017. Genomic relatedness strengthens genetic connectedness across management units. *G3: Genes, Genomes, Genetics*. **10**:3543-3556. doi: [10.1534/g3.117.300151](https://doi.org/10.1534/g3.117.300151).

#### PAPERS IN PROCEEDINGS

1 first author

- 2018
1. **Yu H**, Spangler ML, Lewis RM, and Morota G. 2018. Stronger measures of genomic connectedness enhance prediction accuracies across management units. In: *Proceedings, 11th World Congress of Genetics Applied to Livestock Production*. **11**:406. February 11-16, Auckland, New Zealand. [\[PDF\]](#)

#### CONTRIBUTED PRESENTATIONS

- 2020
6. Development of image analysis pipeline to predict body weight in pigs. EAAP Annual Meeting 2020. Online. December 3.
  5. Development of image analysis pipeline to predict body weight in pigs. ASAS-CSAS-WSASAS Virtual Annual Meeting and Trade Show. Online. July 19-23.
- 2019
4. Precision agriculture on cattle temperament: Utilizing factor analysis and multi-trait modeling to characterize a four-platform standing scale. NCERA-225 Annual Meeting. Implementation and Strategies for National Beef Cattle Genetic Evaluation. Blacksburg, VA. October 10-11.
- 2018
3. An assessment of genomic relatedness across management units. ADSA-ASAS 2018 Midwest Meeting. Omaha, NE. March 12-14.

- 2017
2. Stronger measures of genomic connectedness enhance prediction accuracies across management units. NCERA-225 Annual Meeting. Implementation and Strategies for National Beef Cattle Genetic Evaluation. Stanley Stout Livestock Marketing Center, Manhattan, KS. October 18-19.
  1. Genomic relatedness strengthens genetic connectedness across management units. ASAS-CSAS Annual Meeting and Trade Show. Baltimore, MD. July 8-12.

#### INTRAMURAL SEMINARS

- 2020
- Animal Breeding and Genetics Graduate Student Organization seminar. Department of Animal Science, Iowa State University. October 2.
  - Animal Breeding and Genetics seminar. Department of Animal Science, Iowa State University. September 18.
  - Ph.D. Thesis Defense. Department of Animal and Poultry Sciences, Virginia Polytechnic Institute and State University. March 18.
- 2019
- Ninth Annual Animal and Poultry Sciences Research Symposium. Department of Animal and Poultry Sciences, Virginia Polytechnic Institute and State University. May 21.
  - The Reproductive Biology Club. Department of Animal and Poultry Sciences, Virginia Polytechnic Institute and State University. April 19.
- 2018
- Animal Breeding and Genetics seminar. Department of Animal Science, University of Nebraska-Lincoln. February 28.
- 2017
- Animal Breeding and Genetics seminar. Department of Animal Science, University of Nebraska-Lincoln. February 14.
  - Animal Breeding and Genetics Seminars. Department of Animal Sciences, University of Nebraska-Lincoln. September 29.
- 2016
- M.S. Thesis Defense. Department of Animal Sciences, North Dakota State University. May 17.

#### TEACHING

**Virginia Polytechnic Institute and State University**, Blacksburg, Virginia, USA

##### Guest Instructor

- GWAS Workshop [[Slides](#)] **Summer 2019**

##### Graduate Teaching Assistant

- APSC 5984/20816: Complex Trait Genomics [[WWW](#)] **Spring 2020**
- ALS 3104: Animal Breeding and Genetics **Spring 2019**

##### Tutorials

- Factor Analytic Model [[WWW](#)]
- Gaussian Bayesian Network [[WWW](#)]

- Structural Equation Model GWAS [WWW]

**University of Nebraska-Lincoln**, Lincoln, Nebraska, USA

Guest Instructor

- ASCI 944 / STAT 844 Quantitative Methods for Genomics of Complex Traits **Spring 2018**  
[Slides] [WWW]

**North Dakota State University**, Fargo, North Dakota USA

Graduate Teaching Assistant

- ANSC 357: Animal Genetics **Spring 2016**
- AGRI 189: Skills for Academic Success **Fall 2015**

#### SOFTWARE DEVELOPMENTS

- R package
- GCA - <https://github.com/HaipengU/GCA>

#### PARTICIPATION IN MEETINGS, SYMPOSIUMS, AND WORKSHOPS

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| 2020 | <ul style="list-style-type: none"> <li>• The 6th International Conference of Quantitative Genetics. Online. November 2-12.</li> <li>• The Plant and Animal Genome XXVIII Conference. Town and Country Hotel, San Diego, CA. January 11-15.</li> </ul>  |
| 2015 | <ul style="list-style-type: none"> <li>• NCERA-225 Annual Meeting. Implementation and Strategies for National Beef Cattle Genetic Evaluation. North Dakota State University, ND. October 22-23.</li> <li>• Graduate Learning Conference for College Teaching. North Dakota State University, ND. August 17-18.</li> <li>• WERA-1: Beef Cattle Breeding in the Western Region. Miles City, MT. May 19-20.</li> <li>• ADSA-ASAS Midwest Meeting. Des Moines, IA. March 15-18.</li> </ul> |

#### HONORS/ AWARDS

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|------|---|
| 2020 | <ul style="list-style-type: none"> <li>• The 6th International Conference of Quantitative Genetics US-Based Early Career Researcher Scholarship. Online. November.</li> </ul>   |
| 2019 | <ul style="list-style-type: none"> <li>• 24th Summer Institute in Statistical Genetics (SISG) Scholarship, University of Washington, Seattle, WA, July.</li> <li>• Ninth Annual Animal and Poultry Sciences Research Symposium Travel Award \$400, Virginia Polytechnic Institute and State University, May.</li> </ul> |

2015 • Frank Bain Graduate Student Scholarship \$1,650, North Dakota State University, Spring.

2009-2013 • Outstanding Undergraduate Scholarship, Qingdao Agricultural University, China.

ADDITIONAL  
TRAINING

2019 • Deep Learning for Computer Vision Workshop, Virginia Tech, VA, September 6.

• 24th Summer Institute in Statistical Genetics (SISG), University of Washington, Seattle, WA, July 17-24.

2018 • Programming and Computer Algorithms in Animal Breeding With Focus on Genomic Selection and Single-Step GBLUP, University of Georgia, GA, May 7-25.

2017 • Introduction to Graphical Models With Applications to Quantitative Genetics and Genomics, Iowa State University, IA, June 19-23.

• Software Carpentry Workshop. University of Nebraska-Lincoln, NE, January 5-6.