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Education:

- Ph.D. in Biosystems Engineering, Michigan State University, 2007
- M.S. in Measuring and Testing Technology and Instruments, Tianjin University, China, 2003
- B.S. in Measuring and Control Technology and Instruments, Tianjin University, China, 2000

Research Interests:

- Sensing, control, and automation technologies
- Hyperspectral and multispectral imaging for food safety and quality
- Raman, fluorescence, visible, and NIR spectroscopy and imaging
- Real-time machine vision for automated food processing
- Chemometrics, image processing, and pattern recognition
- Optical properties of food and agricultural products
- Modeling and simulation of light interactions with biological materials

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Publications:

2014

1. **Qin, J.**, Chao, K., and Kim, M. S. 2014. A line-scan hyperspectral system for high-throughput Raman chemical imaging. Applied Spectroscopy, 68 (6), 692-695.
2. **Qin, J.**, Chao, K., Kim, M. S., Lee, H, and Peng, Y. 2014. Development of a Raman chemical imaging detection method for authenticating skim milk powder. Journal of Food Measurement and Characterization, 8 (2), 122-131.
3. Schmidt, W. F., Hapeman, C. J., McConnell, L. L., Mookherji, S., Rice, C. P., Nguyen, J. K., **Qin, J.**, Lee, H., Chao, K., and Kim, M. S. 2014. Temperature-dependent Raman spectroscopic evidence of and molecular mechanism for irreversible isomerization of β-endosulfan to α-endosulfan. Journal of Agricultural and Food Chemistry, 62 (9), 2023-2030.
4. Fu, X., Kim, M. S., Chao, K., **Qin, J.**, Lim, J., Lee, H., Garrido-Varo, A., Perez-Marin, D., and Ying, Y. 2014. Detection of melamine in milk powders based on NIR hyperspectral imaging and spectral similarity analyses. Journal of Food Engineering, 124, 97-104.
5. Dhakal, S., Li, Y., Peng, Y., Chao, K., **Qin, J.**, and Guo L. 2014. Prototype instrument

development for non-destructive detection of pesticide residue in apple surface using Raman technology. Journal of Food Engineering, 123, 94-103.

6. **Qin, J.**, Chao, K., and Kim, M. S. 2014. Authenticating powdered foods and ingredients using a high-throughput Raman chemical imaging method. ASABE Paper No. 141897627. 2014 ASABE Annual International Meeting, Montreal, Quebec, Canada.
7. Dhakal, S., Peng, Y., Li, Y., Chao, K., **Qin, J.**, Zhang, L., and Xu, T. 2014. Rapid detection of chlorpyrifos pesticide residue concentration in agro-product using Raman spectroscopy. Proceedings of SPIE Vol. 9108, 91080O. Defense and Security Symposium 2014, Baltimore, MD. USA.
8. **Qin, J.**, Chao, K., and Kim, M. S. 2014. High-throughput Raman chemical imaging for evaluating food safety and quality. Proceedings of SPIE Vol. 9108, 91080F. Defense and Security Symposium 2014, Baltimore, MD. USA.

2013

1. **Qin, J.**, Chao, K., Kim, M. S., Lu, R., and Burks, T. F. 2013. Hyperspectral and multispectral imaging for evaluating food safety and quality. Journal of Food Engineering, 118 (2), 157-171.
2. **Qin, J.,** Chao, K., and Kim, M. S. 2013. Simultaneous detection of multiple adulterants in dry milk using macro-scale Raman chemical imaging. Food Chemistry, 138 (2-3), 998-1007.
3. **Qin, J.**, Chao, K., and Kim, M. S. 2013. Development of a Raman chemical image detection algorithm for authenticating dry milk. Proceedings of SPIE Vol. 8721, 87210A. Defense and Security Symposium 2013, Baltimore, MD. USA.
4. Chao, K., **Qin, J.**, Kim, M. S., Peng, Y., Chan, D. E., and Cheng, Y. 2013. Raman spectroscopy and imaging to detect contaminants for food safety applications. Proceedings of SPIE Vol. 8721, 872128. Defense and Security Symposium 2013, Baltimore, MD. USA.
5. Dhakal, S., Li, Y., Peng, Y., Chao, K., and **Qin, J.** 2013. Optical instrument development for detection of pesticide residue in apple surface. Proceedings of SPIE Vol. 8721, 872122. Defense and Security Symposium 2013, Baltimore, MD. USA.
6. **Qin, J.**, Chao, K., Cheng, Y., and Kim, M. S. 2013. Authentication of milk powder using Raman scattering spectroscopy and imaging. ASABE Paper No. 131591839. 2013 ASABE Annual International Meeting, Kansas City, MO. USA.
7. Dhakal, S., Li, Y., Peng, Y., Chao, K., and **Qin, J.** 2013. Nondestructive detection of pesticide residue concentration in apple by Raman spectral technology. ASABE Paper No. 131587022. 2013 ASABE Annual International Meeting, Kansas City, MO. USA.
8. Niphadkar, N. P., Burks, T. F., **Qin, J.**, and Ritenour, M. A. 2013. Edge effect compensation for citrus canker lesion detection due to light source variation - a hyperspectral imaging application. Agricultural Engineering International: CIGR Journal, 15 (4), 314-327.
9. Niphadkar, N. P., Burks, T. F., **Qin, J.**, and Ritenour, M. A. 2013. Estimation of citrus canker lesion size using hyperspectral reflectance imaging. International Journal of Agricultural and Biological Engineering, 22 (3), 41-51.

2012

1. **Qin, J.** 2012. Chapter 2: Hyperspectral and multispectral imaging in the food and beverage industries. In Computer Vision Technology in the Food and Beverage Industries (Ed. Da-Wen Sun), 27-63. Cambridge, UK: Woodhead Publishing Ltd.
2. **Qin, J.,** Chao, K., and Kim, M. S. 2012. Nondestructive evaluation of internal maturity of tomatoes using spatially offset Raman spectroscopy. Postharvest Biology and Technology, 71, 21-31.
3. **Qin, J.**, Burks, T. F., Zhao, X., Niphadkar, N., and Ritenour, M. A. 2012. Development of a

two-band spectral imaging system for real-time citrus canker detection. Journal of Food Engineering, 108 (1), 87-93.

4. **Qin, J.**, Chao, K., and Kim, M. S. 2012. Evaluating internal maturity of tomatoes using spatially offset Raman spectroscopy. ASABE Paper No. 121337431. 2012 ASABE Annual International Meeting, Dallas, TX. USA.
5. **Qin, J.**, Chao, K., and Kim, M. S. 2012. Detecting multiple adulterants in dry milk using Raman chemical imaging. Proceedings of SPIE Vol. 8369, 83690H. Defense and Security Symposium 2012, Baltimore, MD. USA.
6. Cheng, Y., **Qin, J.**, Lim, J., Chan, D. E., Kim, M. S., and Chao, K. 2012. An investigation of FT-Raman spectroscopy for quantification of additives to milk. Proceedings of SPIE Vol. 8369, 83690W. Defense and Security Symposium 2012, Baltimore, MD. USA.

2011

1. **Qin, J.**, Burks, T. F., Zhao, X., Niphadkar, N., and Ritenour, M. A. 2011. Multispectral detection of citrus canker using hyperspectral band selection. Transactions of the ASABE, 54 (6), 2331-2341.
2. **Qin, J.,** Chao, K., and Kim, M. S. 2011. Investigation of Raman chemical imaging for detection of lycopene changes in tomatoes during postharvest ripening. Journal of Food Engineering, 107 (3-4), 277-288.
3. **Qin, J.,** Chao, K., Kim, M. S., Kang, S., and Jun, W. 2011. Detection of organic residues on poultry processing equipment surfaces by LED-induced fluorescence imaging. Applied Engineering in Agriculture, 27 (1): 153-161.
4. **Qin, J.**, Chao, K., and Kim, M. S. 2011. Evaluating carotenoid changes in tomatoes during postharvest ripening using Raman chemical imaging. Proceedings of SPIE Vol. 8027, 802703. Defense and Security Symposium 2011, Orlando, FL. USA.
5. Chao, K., **Qin, J.**, Kim, M. S., and Mo, C. Y. 2011. A Raman chemical imaging system for detection of contaminants in food. Proceedings of SPIE Vol. 8027, 802710. Defense and Security Symposium 2011, Orlando, FL. USA.
6. Tang, X., Mo, C. Y., Chan, D. E., Peng, Y., **Qin, J.**, Yang, C. C., Kim, M. S., and Chao, K. 2011. Physical and mechanical properties of spinach for whole-surface online imaging inspection. Proceedings of SPIE Vol. 8027, 802711. Defense and Security Symposium 2011, Orlando, FL. USA.

2010

1. **Qin, J.** 2010. Chapter 5: Hyperspectral imaging instruments. In Hyperspectral Imaging for Food Quality Analysis and Control (Ed. Da-Wen Sun), 127-172. San Diego, CA: Academic Press, Elsevier.
2. **Qin, J.,** Chao, K., and Kim, M. S. 2010. Raman chemical imaging system for food safety and quality inspection. Transactions of the ASABE, 53(6): 1873-1882.
3. Zhao, X., Burks, T. F., **Qin, J.**, and Ritenour, M. A. 2010. Effect of fruit harvest time on citrus canker detection using hyperspectral reflectance imaging. Sensing and Instrumentation for Food Quality and Safety, 4(3): 126-135.
4. **Qin, J.**, Chao, K., and Kim, M. S. 2010. Development of a Raman chemical imaging system for food safety inspection. ASABE Paper No. 1009166. 2010 ASABE Annual International Meeting, Pittsburgh, PA. USA.
5. Chao, K., Liu, Y., Kim, M. S., Yang, C.-C., and **Qin, J.** 2010. Surface-enhanced Raman scattering spectroscopy for rapid bacterial screening. ASABE Paper No. 1008542. 2010 ASABE Annual International Meeting, Pittsburgh, PA. USA.
6. **Qin, J.**, Jun, W., Kim, M. S., and Chao, K. 2010. Detection of organic residues on food

processing equipment surfaces by spectral imaging method. Proceedings of SPIE Vol. 7676, 767608. Defense and Security Symposium 2010, Orlando, FL. USA.

2009

1. Zhao, X., Burks, T. F., **Qin, J.**, and Ritenour, M. A. 2009. Digital microscopic imaging for citrus peel disease classification using color texture features. Applied Engineering in Agriculture, 25(5): 769-776.
2. Kim, D. G., Burks, T. F., Schumann, A. W., Zekri, M., Zhao, X., and **Qin, J.** 2009. Detection of citrus greening using microscopic imaging. Agricultural Engineering International: The CIGR EJournal, Vol. XI, Manuscript 1194.
3. Kim, D. G., Burks, T. F., **Qin, J.**, and Bulanon, D. M. 2009. Classification of grapefruit peel diseases using color texture feature analysis. International Journal of Agricultural and Biological Engineering, 2(3): 41-50.
4. **Qin, J.** and Lu, R. 2009. Monte Carlo simulation for quantification of light transport features in apples. Computers and Electronics in Agriculture, 68(1): 44-51.
5. **Qin, J.**, Lu, R., and Peng, Y. 2009. Prediction of apple internal quality using spectral absorption and scattering properties. Transactions of the ASABE, 52(2): 499-507.
6. **Qin, J.**, Burks, T. F., Ritenour, M. A., and Bonn, W. G. 2009. Detection of citrus canker using hyperspectral reflectance imaging with spectral information divergence. Journal of Food Engineering, 93(2): 183-191.
7. **Qin, J.**, Burks, T. F., Zhao, X., Niphadkar, N., and Ritenour, M. A. 2009. Hyperspectral band selection for citrus canker detection using multispectral algorithms. ASABE Paper No. 096144. 2009 ASABE Annual International Meeting, Reno, NV. USA.
8. Niphadkar, N., Burks, T. F., **Qin, J.**, and Ritenour, M. A. 2009. Estimation of detection limit for size of citrus canker lesions based on hyperspectral reflectance imaging. ASABE Paper No. 096254. 2009 ASABE Annual International Meeting, Reno, NV. USA.
9. Lu, R., Huang, M., and **Qin, J.** 2009. Analysis of hyperspectral scattering characteristics for predicting apple fruit firmness and soluble solids content. Proceedings of SPIE Vol. 7315, 73150I. Defense and Security Symposium 2009, Orlando, FL. USA.

2008

1. **Qin, J.**, Burks, T. F., Kim, M. S., Chao, K., and Ritenour, M. A. 2008. Citrus canker detection using hyperspectral reflectance imaging and PCA-based image classification method. Sensing and Instrumentation for Food Quality and Safety, 2(3): 168-177.
2. **Qin, J.** and Lu, R. 2008. Measurement of the optical properties of fruits and vegetables using spatially resolved hyperspectral diffuse reflectance imaging technique. Postharvest Biology and Technology, 49(3): 355-365.
3. **Qin, J.**, Burks, T. F., Ritenour, M. A., and Bonn, W. G. 2008. Detecting citrus canker by hyperspectral reflectance imaging and spectral information divergence. ASABE Paper No. 084066. 2008 ASABE Annual International Meeting, Providence, RI. USA.
4. **Qin, J.**, Peng, Y., and Bailey, B. B. 2008. Comparison of methods for analyzing hyperspectral scattering images to predict apple fruit firmness and soluble solids content. ASABE Poster. 2008 ASABE Annual International Meeting, Providence, RI. USA.
5. **Qin, J.**, Burks, T. F., Kim, D. G., and Bulanon, D. M. 2008. Classification of citrus peel diseases using color texture feature analysis. 2008 Food Processing Automation Conference, Providence, RI. USA.
6. **Qin, J.**, Burks, T. F., Kim, M. S., Chao, K., and Ritenour, M. A. 2008. Detecting citrus canker by hyperspectral reflectance imaging and PCA-based image classification method. Proceedings of SPIE Vol. 6983, 698305. Defense and Security Symposium 2008, Orlando,

FL. USA.

2007

1. **Qin, J.** and Lu, R. 2007. Measurement of the absorption and scattering properties of turbid liquid foods using hyperspectral imaging. Applied Spectroscopy, 61(4): 388-396.
2. **Qin, J.**, Lu, R., and Peng, Y. 2007. Internal quality evaluation of apples using spectral absorption and scattering properties, Proceedings of SPIE Vol. 6761, 67610M. Optics East 2007, Boston, MA. USA.
3. **Qin, J.** and Lu, R. 2007. Monte Carlo simulation of light propagation in apples. ASABE Paper No. 073058. 2007 ASABE Annual International Meeting, Minneapolis, MN. USA.

2006

1. **Qin, J.** and Lu, R. 2006. Hyperspectral diffuse reflectance for rapid, noncontact measurement of the optical properties of turbid materials. Applied Optics, 45(32): 8366-8373.
2. Lu, R., **Qin, J.**, and Peng, Y. 2006. Measurement of the optical properties of apples by hyperspectral imaging for assessing fruit quality. ASABE Paper No. 066179. 2006 ASABE Annual International Meeting, Portland, OR. USA.
3. **Qin, J.** and Lu, R. 2006. Measurement of the optical properties of apples using hyperspectral diffuse reflectance imaging. ASABE Paper No. 063037. 2006 ASABE Annual International Meeting, Portland, OR. USA.

2005

1. **Qin, J.** and Lu, R. 2005. Detection of pits in tart cherries by hyperspectral transmission imaging. Transactions of the ASABE, 48(5): 1963-1970.
2. **Qin, J.** and Lu, R. 2005. Hyperspectral diffuse reflectance for determination of the optical properties of milk and fruit and vegetable juice. Proceedings of SPIE Vol. 5996, 59960Q. Optics East 2005, Boston, MA. USA.
3. **Qin, J.** and Lu, R. 2005. Determination of the optical properties of turbid materials by hyperspectral diffuse reflectance, ASABE Paper No. 053068. 2005 ASABE Annual International Meeting, Tampa, FL. USA.

2004

1. **Qin, J.** and Lu, R. 2004. Detecting pits in tart cherries by hyperspectral transmission imaging. Proceedings of SPIE Vol. 5587, p. 153-162. Optics East 2004, Philadelphia, PA. USA.