

Daniel McKewn Jenkins  
**College of Tropical Agriculture and Human Resources**  
Molecular Biosciences and Bioengineering  
FTE Distribution: 30% I; 70% R; 0% E

**Education**

<u>Degree</u>	<u>University</u>	<u>Major</u>
Bachelors	Cornell University	Agricultural and Biological Engineering
Masters	Cornell University	Agricultural and Biological Engineering
PhD	University of California, Davis	Biological and Agricultural Engineering

**Lifetime and Fellow Achievement Awards (peer nominated and endorsed national and International-important for those without accreditation that is peer nominated and endorsed, recognized)**

**Professional Appointments**

<u>Title</u>	<u>Employer</u>	<u>Dates Employed</u>
Assistant Professor	University of Hawaii	August 2002 – June 2007
Associate Professor	University of Hawaii	July 2007 – June 2015
Professor	University of Hawaii	July 2015 - Present
Chief Technical Officer	Diagenetix, Inc	2010 - Present

**Courses Taught**

Course Number and Title (credits)

BE 420 / EE 422 / MBBE 420 Sensors and Instrumentation for Biological Systems  
BE 625 / MBBE 625 Biological Instrumentation

**Publications (reverse chronological order)**

Books

1. **Jenkins, D. M.** 2001 Manometric sensor to measure urea in milk for improvement of dairy cow nutritional management. Ph.D. Dissertation, University of California, Davis.

Book Chapters

Conference Proceedings

1. Rodriguez, R., J. K. Leary, and **D. M. Jenkins**. 2017. Enhancing invasive species control with unmanned aerial systems and herbicide ballistic technology. ASABE Paper #1700668. ASABE Annual International Meeting, Spokane, WA.
2. Diaz, L., **D. M. Jenkins**, Y. Li, T., T. McNealy, and T. R. Tzeng. 2017. Electroflotation of *Escherichia coli* 25922 improves detection rates by Loop-mediated isothermal amplification. ASABE Paper #1701064. ASABE Annual International Meeting, Spokane, WA.
3. Rodriguez, R., **D. M. Jenkins**, J. K. Leary, K. Nolan, and B. Mahnken. 2016. Performance analysis of consumer grade GPS units for dynamic aerial applications. ASABE Paper #2460946. ASABE Annual International Meeting, Orlando, FL.
4. Rodriguez, R., J. K. Leary, **D. M. Jenkins**, and B. Mahnken. 2015. Spatial tracking analysis of operations characterizing performance of target treatment. ASABE Paper #2190119. ASABE Annual International Meeting, New Orleans, LA.
5. **Jenkins, D. M.**, Y. Li, R. Kubota, D. Garmire, and T. McNealy. Nanoparticle assisted biofilm disruption for rapid recovery and detection of bacterial pathogens. 2014. IEEE-NEMS Paper #328. IEEE Nano/ micro Engineered and Molecular Systems Conference, Waikiki, HI.
6. Rodriguez, R. **D. M. Jenkins**, J. Leary, and B. Mahnken. 2014. A custom GPS recording system for improving operational performance of aerially-deployed herbicide ballistic technology. ASABE Paper # 1899605. ASABE Annual International Meeting, Montreal, Canada.

7. Rodriguez, R. **D. M. Jenkins**, J. Leary. 2014. Performance evaluation of a GPS logger system for recording aerial-deployed herbicide ballistic technology operations. IEEE IcIAFS Paper #3346677. IEEE International Conference on Information and Automation for Sustainability, Colombo, Sri Lanka.
8. Kubota, R., N. Y. Kawabata, A. I. Miyamoto, A. M. Alvarez, M. A. Schell, C. Allen, and **D. M. Jenkins**. 2009. Engineering a real-time disposable platform for discrimination of sub-populations of *Ralstonia solanacearum*. ASABE Paper # 097412. ASABE Annual International Meeting, Reno, NV.
9. Teruel, M., A. Bhawuk, J. Reyes-de-Corcuera, and **D. M. Jenkins**. 2007. Modeling an validation of an unusual kinetic phenomenon during the enzymatic hydrolysis of lactose to glucose. ASABE Paper # 073017. ASABE Annual International Meeting, Minneapolis, MN.
10. C. Zhu, W.-W. Su, and **D. M. Jenkins, D. M.** 2007. A simple hybrid circuit for direct determination of fluorescence lifetimes. ASABE Paper # 073062. ASABE Annual International Meeting, Minneapolis, MN.
11. M. Safeeq, A. Fares, and **D. M. Jenkins**. 2006. Temperature dependent scaled voltage to improve the performance of single capacitance sensors. ASAE Paper # 062121. ASAE Annual International Meeting, Portland, OR.
12. **Jenkins, D. M.**, M. Kreuzer, B. Chami, G. Presting, A. Alvarez, and B. Liaw. 2005. Label free electrochemical detection of nucleic acid on a disposable electrode. ASAE Paper # 057029. ASAE Annual International Meeting, Tampa, FL.
13. **Jenkins, D. M.** 2005. Overshoot of chemical equilibrium recorded with a glucose electrode. ASAE Paper # 057023, ASAE Annual International Meeting, Tampa, FL.
14. **Jenkins, D. M.**, C. Zhu, and W.-W. Su. 2005. Comparison of prototype circuits for direct measurement of fluorescence lifetime. ASAE Paper # 053036, ASAE Annual International Meeting, Tampa, FL.
15. Krishnan, A. and **D. M. Jenkins**. 2005. A new psychrometric sensor for soil moisture. ASAE Paper 052181, ASAE Annual International Meeting, Tampa, FL.
16. **Jenkins, D. M.**, G. Cheney, S. Irei, A. Cheung, and W.-W. Su. 2004. Prototype detector for fluorescence lifetime. ASAE Paper # 043111, ASAE Annual International Meeting, Ottawa, Canada.
17. **Jenkins, D. M.** and A. Krishnan. 2004. Surface limitations for gas transport through a silicone film. ASAE Paper # 043052, ASAE Annual International Meeting, Ottawa, Canada.
18. **Jenkins, D. M.** and A. Krishnan. 2003. Improving dynamic performance and specificity in immersible dissolved gas biosensors. ASAE Paper # 037001, ASAE Annual International Meeting, Las Vegas, NV.
19. **Jenkins, D. M.** and M. J. Delwiche. 2001. Manometric sensors for on-line measurement of lactose, glucose, and dissolved gases. ASAE Paper # 013008, ASAE Annual International Meeting, Sacramento, CA.
20. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 2000. Application of an on-line pressure based sensor for milk urea. EurAgEng. Warwick, UK, 2000.
21. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 1999. On-line biosensor for measurement of milk urea in the dairy parlor. ASAE Paper # 993023, ASAE Annual International Meeting, Toronto, Canada.
22. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 1998. Automated biosensor for measurement of milk urea. EurAgEng Paper # 98-B-014, EurAgEng, Oslo, Norway.

#### Refereed Journal Publications

2. McLamore, E., S. P. A. Datta, V. Morgan, N. Cavallaro, G. Kiker, **D. M. Jenkins**, Y. Rong, C. Gomes, J. Claussen, D. Vanegas, and E. Alocilja. 2019. SNAPS: Sensor Analytics Point Solutions for detection and decision support systems. *Sensors* 19(22): 4935. [5 year impact factor 3.031. Contributions to: research- 0%; writing- 10%; conceptualization- 5%; data analysis- n/a / review paper; funding- 0%]
3. **Jenkins, D. M.**, B. E. Lee, S. Jun, J. Reyes-de-Corcuera, and E. S. McLamore. 2019. ABE-Stat, a fully open-source and versatile wireless potentiostat project including electrochemical impedance spectroscopy. *Journal of the Electrochemical Society* 166(9): B3056-B3065. [5 year impact factor 3.662. Contributions to: research- 75%; writing- 95%; conceptualization- 100%; data analysis- 100%; funding- 100%]

4. Diaz, L., Y. Li, R. Kubota, and **D. M. Jenkins**. 2018. Characterization of a portable, non-instrumented incubator for enrichment of *Escherichia coli* O157:H7 and *Salmonella* serovar Typhimurium and detection by Loop Mediated Isothermal Amplification (LAMP). *Food Protection Trends* 39(1): 40-50. [5 year impact factor 0.3. Contributions to: research- 50%; writing- 20%; conceptualization- 100%; data analysis- 30%; funding- 100%]
5. Larrea-Sarmiento, A., U. Dhakal, G. Boluk, L. Fatdal, A. Alvarez, A. Strayer, M. Paret, J. Jones, **D. M. Jenkins**, and M. Arif. 2018. Development of a genome-informed loop mediated isothermal amplification assay for rapid and specific detection of *Xanthomonas euvesicatoria*. *Scientific Reports* 8:14298. [5 year impact factor 4.011. Contributions to: research- 10%; writing- 5%; conceptualization- 5%; data analysis- 5%; funding- 0%]
6. **Jenkins, D. M.** and R. Kurasaki. 2018. ABE-VIEW: Android interface for wireless data acquisition and control. *Sensors* 18(8): 2647. [5 year impact factor 3.031. Contributions to: research- 95%; writing- 95%; conceptualization- 100%; data analysis- 95%; funding- 100%]
7. Diaz, L., **D. M. Jenkins**, Y. Li, T. McNealy, N. Walter, and R. Kubota. 2018. Electroflotation of *Escherichia coli* improves detection rates by Loop-mediated isothermal amplification. *Transactions of the American Society of Agricultural and Biological Engineers* 61(4): 1209-1220. [5 year impact factor 1.349. Contributions to: research- 10%; writing- 20%; conceptualization- 90%; data analysis- 30%; funding- 100%]
8. Rodriguez, R., **D. M. Jenkins**, J. K. Leary, K. Nolan, and B. V. Mahnken. 2018. Performance analysis of different grades of handheld GPS units in manned helicopter operations. *IEEE Aerospace and Electronic Systems* 33(10): 14-20. [5 year impact factor 2.063. Contributions to: research- 10%; writing- 10%; conceptualization- 5%; data analysis- 5%; funding- 0%]
9. Rodriguez, R., J. K. Leary, **D. M. Jenkins**, and B. V. Mahnken. 2016. Herbicide Ballistic Technology: spatial tracking analysis of operations characterizing performance of target treatment. *Transactions of the ASABE* 59(3): 803-809. [5 year impact factor 1.349. Contributions to: research- 15%; writing- 25%; conceptualization- 25%; data analysis- 25%; funding- 0%]
10. Rodriguez, R., **D. M. Jenkins**, and J. Leary. 2015. Design and validation of a GPS logger system for recording aerially-deployed herbicide ballistic technology operations. *IEEE Sensors* 15(4): 2078-2086. [5 year impact factor 3.076. Contributions to: research- 35%; writing- 35%; conceptualization- 75%; data analysis- 35%; funding- 0%]
11. Kubota, R. and **D. M. Jenkins**. 2015. Real-time multiplex applications of Loop Mediated AMPLification by Assimilating Probes. *International Journal of Molecular Sciences*. 16(3), 4786-4799. [5 year impact factor 4.183. Contributions to: research- 5%; writing- 60%; conceptualization- 40%; data analysis- 75%; funding- 100%]
12. Keremane, M. L., C. Ramadugu, E. Rodriguez, R. Kubota, S. Shibata, D. G. Hall, M. L. Roose, **D. M. Jenkins**, and R. F. Lee. 2015. A rapid field detection system for citrus huanglongbing associated '*Candidatus Liberibacter asiaticus*' from the psyllid vector, *Diaphorina citri* Kuwayama and its implications in disease management. *Crop Protection* 68:41-48. [5 year impact factor 1.920. Contributions to: research- 10%; writing- 10%; conceptualization- 10%; data analysis- 5%; funding- 100%]
13. **Jenkins, D. M.**, J. Jones, and R. Kubota. 2014. Evaluation of portable DNA-based technologies for identification of *Ralstonia solanacearum* race 3 biovar 2 in the field. 2014. *Biological Engineering Transactions* 7(2):83-96. [5 year impact factor 1.349. Contributions to: research- 75%; writing- 95%; conceptualization- 50%; data analysis- 80%; funding- 100%]
14. Yasuhara-Bell, J. H., R. Kubota, **D. M. Jenkins**, and A. M. Alvarez. 2013. Loop-mediated amplification of the *Clavibacter michiganensis* subsp. *michiganensis* micA gene is highly specific. *Phytopathology*. 103(12):1220-1226. [5 year impact factor 2.924. Contributions to: research- 0%; writing- 20%; conceptualization- 20%; data analysis- 20%; funding- 0%]
15. Marrero, G., K. L. Schneider, **D. M. Jenkins**, and A. M. Alvarez. 2013. Phylogeny and classification of *Dickeya* based on multilocus sequence analysis. *International Journal of Systematic and Evolutionary Microbiology*. 63(9):3524-3539. [5 year impact factor 2.438. Contributions to: research- 0%; writing- 15%; conceptualization- 15%; data analysis- 15%; funding- 80%]
16. Kubota, R., P. LaBarre, B. H. Weigl, and **D. M. Jenkins**. 2013. Molecular diagnostics in a teacup: non-instrumented nucleic acid amplification (NINA) for rapid, low cost detection of *Salmonella enterica*. *Chinese Science Bulletin*. 58(1):1-7. [5 year impact factor 1.243. Contributions to: research- 50%; writing- 75%; conceptualization- 100%; data analysis- 75%; funding- 100%]
17. Jenkins, D. A., P. E. Kendra, N. D. Epsky, W. S. Montgomery, R. R. Heath, **D. M. Jenkins**, and R. Goenaga. 2012. Antennal responses of West Indian and Caribbean fruit flies (*diptera: tephritidae*) to ammonium

- bicarbonate and putrescine. *Florida Entomologist*. 95(1):28-34. [5 year impact factor 1.371. Contributions to: research- 0%; writing- 10%; conceptualization- 20%; data analysis- 30%; funding- 0%]
18. **Jenkins, D. M.**, R. Kubota, J. Dong, Y. Li, and D. Higashiguchi. 2011. Low-cost handheld device for sequence-specific real-time LAMP-based detection of *Salmonella enterica*. *Biosensors and Bioelectronics* 30(1):255-260. [5 year impact factor 5.637. Contributions to: research- 75%; writing- 100%; conceptualization- 100%; data analysis- 100%; funding- 100%]
  19. Kubota, R., P. LaBarre, J. Singleton, A. Beddoe, B. H. Weigl, A. M. Alvarez, and **D. M. Jenkins**. 2011. Non-Instrumented Nucleic Acid Amplification (NINA) for rapid detection of *Ralstonia solanacearum* race 3 biovar 2. *Biological Engineering Transactions*. 4(2):69-80. [5 year impact factor 1.10. Contributions to: research- 50%; writing- 75%; conceptualization- 100%; data analysis- 75%; funding- 100%]
  20. † Kubota, R., A. M. Alvarez, and W.-W. Su, and **D. M. Jenkins**. 2011. FRET-based assimilating probe for sequence specific real-time monitoring of Loop Mediated isothermal AMPLification. *Biological Engineering Transactions*. 4(2):81-100. [5 year impact factor 1.10. Contributions to: research- 10%; writing- 50%; conceptualization- 50%; data analysis- 80%; funding- 100%]
  21. Yang, K., **D. M. Jenkins**, and W.-W. Su. 2011. Rapid concentration of bacteria using submicron magnetic ion exchangers for improving PCR-based multiplex pathogen detection. *Journal of Microbiological Methods*. 86(1):69-77. [5 year impact factor 2.544. Contributions to: research- 10%; writing- 20%; conceptualization- 20%; data analysis- 20%; funding- 0%]
  22. Kubota, R., M. A. Schell, G. D. Peckham, J. Rue, A. M. Alvarez, C. Allen, and **D. M. Jenkins**. 2011. In silico genomic subtraction guides development of highly accurate, DNA-based diagnostics for *Ralstonia solanacearum* race 3 biovar 2 and blood disease bacterium. *Journal of General Plant Pathology*. 77(3):182-193. [5 year impact factor 0.689. Contributions to: research- 0%; writing- 30%; conceptualization- 30%; data analysis- 30%; funding- 50%]
  23. Paret M. L., R. Kubota, **D. M. Jenkins**, and A. M. Alvarez. 2010. Survival of *Ralstonia solanacearum* race 4 in drainage water and soil, and detection with immunodiagnostic and DNA-based assays. *HortTechnology*. 20(3):539-548. [5 year impact factor 0.516. Contributions to: research- 0%; writing- 10%; conceptualization- 10%; data analysis- 20%; funding- 30%]
  24. **Jenkins D. M.**, Song, C., S. Fares, H. Cheng, and D. Barrettino. 2009. Disposable thermostated electrode for temperature dependent electrochemical measurements. *Sensors and Actuators, B- Chemical*. 137(1):222-229. [5 year impact factor 3.751. Contributions to: research- 70%; writing- 100%; conceptualization- 100%; data analysis- 100%; funding- 100%]
  25. Kutin, R., A. Alvarez, and **D. M. Jenkins**. 2009. Detection of *Ralstonia solanacearum* in natural substrates using phage amplification integrated with real-time PCR assay. *Journal of Microbiological Methods*. 76(3):241-246. [5 year impact factor 2.544. Contributions to: research- 0%; writing- 40%; conceptualization- 75%; data analysis- 50%; funding- 100%]
  26. Teruel, M. J., **D. M. Jenkins**, and J. I. Reyes de Corcuera. 2009. Crystallization of  $\beta$ -D-glucose and analysis with a simple glucose biosensor. *Journal of Chemical Education*. 86(8):959-961. [5 year impact factor 0.763. Contributions to: research- 50%; writing- 50%; conceptualization- 100%; data analysis- 50%; funding- 100%]
  27. Fares, A., M. Safeeq, and **D. M. Jenkins**. 2009. Adjusting temperature and salinity effects on single capacitance sensors. *Pedosphere*. 19(5):588-596. [5 year impact factor 1.54. Contributions to: research- 0%; writing- 10%; conceptualization- 20%; data analysis- 20%; funding- 0%]
  28. **Jenkins, D. M.**, M. J. Teruel, J. I. Reyes de Corcuera, and O. Young. 2008. Simultaneous determination of hydrolysis and mutarotation rates during the enzymatic hydrolysis of lactose. *Journal of Agricultural and Food Chemistry*. 56(18):8303-8308. [5 year impact factor 3.239. Contributions to: research- 90%; writing- 90%; conceptualization- 100%; data analysis- 90%; funding- 100%]
  29. Kutin, K., **D. M. Jenkins**, & D. Borthakur. 2008. Characterization of a *Corynebacterium* strain that can grow in medium containing up to 2 M nitrate. *Bioremediation Journal*. 12(3):168-172. [5 year impact factor 0.784. Contributions to: research- 0%; writing- 20%; conceptualization- 20%; data analysis- 20%; funding- 100%]
  30. Kubota, R., **D. M. Jenkins**, B. Vine, and A. Alvarez. 2008. Detection of *Ralstonia solanacearum* by Loop-mediated isothermal AMPLification method (LAMP). *Phytopathology* 98(9):1045-1051. [5 year impact factor 2.924. Contributions to: research- 0%; writing- 50%; conceptualization- 50%; data analysis- 50%; funding- 100%]

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† select paper award

31. **Jenkins, D. M.**, C. Zhu, and W. Su. 2008. A simple hybrid circuit for direct detection of fluorescence lifetimes. *Applied Engineering in Agriculture*. 24(2):259-263. [5 year impact factor 0.78. Contributions to: research- 50%; writing- 90%; conceptualization- 90%; data analysis- 90%; funding- 100%]
32. D. A. Jenkins, E. Diaz, R. Goenaga, and **D. M. Jenkins**. 2008. Solar sterilization of abscised fruit: a cultural practice to reduce infestations of *Anastrepha* spp. around orchards. *The Journal of Agriculture of the University of Puerto Rico*. 92:197-206. [5 year impact factor 0.067. Contributions to: research- 0%; writing- 10%; conceptualization- 10%; data analysis- 20%; funding- 0%]
33. Fares, A., H. Hamdhani, and **D. M. Jenkins**. 2007. Temperature Dependent Scaled Frequency to Improve the Accuracy of Multisensor Capacitance Probes. *Soil Science Society of America Journal*. 71(3):894-900. [5 year impact factor 2.688. Contributions to: research- 0%; writing- 10%; conceptualization- 10%; data analysis- 15%; funding- 0%]
34. **Jenkins, D. M.**, B. Chami, M. Kreuzer, G. Presting, A. Alvarez, and B. Y. Liaw. 2006. Hybridization probe for femtomolar quantification of selected nucleic acids on a disposable electrode. *Analytical Chemistry*. 78(7):2314-2318. [5 year impact factor 5.983. Contributions to: research- 30%; writing- 90%; conceptualization- 100%; data analysis- 50%; funding- 100%]
35. **Jenkins, D. M.** 2004. Desorption as a rate limiting step for gas permeation through a polymer membrane. *Journal of Physical Chemistry, B*. 108(50):19,325-19,329. [5 year impact factor 3.751. Contributions to: research- 100%; writing- 100%; conceptualization- 100%; data analysis- 100%; funding- 100%]
36. **Jenkins, D. M.** & D. A. Jenkins. 2003. Digital detector array for the study of non-specifically tagged bees and wasps. *Biosystems Engineering*. 86(3):295-303. [5 year impact factor 1.502. Contributions to: research- 100%; writing- 100%; conceptualization- 70%; data analysis- 50%; funding- 50%]
37. **Jenkins, D. M.** & M. J. Delwiche. 2003. An immersible manometric sensor for measurement of humidity and enzyme mediated changes in dissolved gas. *Biosensors & Bioelectronics*. 18(9):1085-1093. [5 year impact factor 5.637. Contributions to: research- 100%; writing- 90%; conceptualization- 100%; data analysis- 100%; funding- 0%]
38. **Jenkins, D. M.** & M. J. Delwiche. 2003. Adaptation of a manometric biosensor to measure glucose and lactose. *Biosensors & Bioelectronics*. 18(1):101-107. [5 year impact factor 5.637. Contributions to: research- 100%; writing- 90%; conceptualization- 100%; data analysis- 100%; funding- 0%]
39. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 2002. Factors affecting the application of on-line milk urea sensing. *Transactions of the ASAE*. 45(5):1687-1695. [5 year impact factor 1.10. Contributions to: research- 60%; writing- 70%; conceptualization- 50%; data analysis- 90%; funding- 0%]
40. **Jenkins, D. M.**, M. J. Delwiche and R. W. Claycomb. 2002. Electrically controlled sampler for milk component sensors. *Applied Engineering in Agriculture*. 18(3):373-378. [5 year impact factor 0.78. Contributions to: research- 100%; writing- 90%; conceptualization- 80%; data analysis- 100%; funding- 0%]
41. **Jenkins, D. M.** & M. J. Delwiche. 2002. Manometric biosensor for on-line measurement of milk urea. *Biosensors & Bioelectronics*. 17(6-7):557-563.
42. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 2000. Refinement of the pressure assay for milk urea nitrogen. *Journal of Dairy Science*. 83(9):2042-2048.
43. **Jenkins, D. M.**, M. J. Delwiche, E. J. DePeters, and R. H. BonDurant. 1999. Chemical assay of urea for automated sensing in milk. *Journal of Dairy Science*. 82(9):1999-2004.

#### Extension Publications

#### Creative Works (i.e., Extension Videos, Websites, Blogs, Creative Designs and Exhibitions, etc.)

##### **Published apps**

1. *ABE-Stat*. [https://play.google.com/store/apps/details?id=com.diagenetix.abestat&hl=en\\_US](https://play.google.com/store/apps/details?id=com.diagenetix.abestat&hl=en_US)

This app was developed to interface wirelessly with a custom designed palm-sized “potentiostat” for making electrochemical measurements. The project was intended to support collaborators on USDA projects developing advanced electrochemistry based biological and chemical sensors for field use. Further details

about this app (including links to open-source code, and open-source design files for the associated instrument) are available in an open access research article <http://jes.ecsdl.org/content/166/9/B3056.full>

2. *ABE-VIEW*. [https://play.google.com/store/apps/details?id=com.uhmbe.DAQCTRL&hl=en\\_US](https://play.google.com/store/apps/details?id=com.uhmbe.DAQCTRL&hl=en_US)

This app was originally developed to provide a generic wireless interface to student hardware projects in the Biological Engineering program at UH, since the defendant has virtually never received material University support for teaching his lab and design intensive courses. Eventually in the spirit of the open source movement to support other cash-strapped programs, the defendant made the app freely available on Google Play. Further details about this app (including links to open-source code, and open-source design files for the associated instrument) are also available in an open access research article <https://www.mdpi.com/1424-8220/18/8/2647/htm>

3. *HBT-TS*. [https://play.google.com/store/apps/details?id=com.gps.hbt&hl=en\\_US](https://play.google.com/store/apps/details?id=com.gps.hbt&hl=en_US)

This app was developed to record operational data for “Herbicide Ballistic Technology” missions where herbicide is applied to invasive plants in remote landscapes of Hawaii from a helicopter (the app interfaces wirelessly to a small instrumented mounted on a paintball marker, that records the time, origin, and trajectory of every herbicide-containing capsule) This (free) app and associated hardware has been institutionalized in operations of the Hawaii Invasive Species Committees (HISC), which supported the development.

4. *GPS Field Tags*. [https://play.google.com/store/apps/details?id=com.diagenetix.gpsfieldtags&hl=en\\_US](https://play.google.com/store/apps/details?id=com.diagenetix.gpsfieldtags&hl=en_US)

This app was adapted from features of other apps developed by the defendant (largely HBT-TS above and BioRanger below) to allow users to record tracks, and drop marks and record pictures of features / locations of interest in the terrain. It was developed largely for the personal use of the defendant, and made freely available on Google Play as a possible public service to those working in conservation and other outdoor industries.

### Unpublished Apps

5. *BioRanger*. This app is made to interface with the core technology sold by Diagenetix- the “BioRanger” instrument that can conduct quantitative fluorescence based isothermal assays of specific nucleic acid (DNA or RNA) sequences (i.e. for detection of specific pathogens or other organisms). This app is freely distributed by Diagenetix with the BioRanger instrument that users must buy from Diagenetix.
6. *Spray-Ball-TS*. This app is very similar to HBT-TS described above, but designed to record information including swath widths of herbicides sprayed from a spray boom instead of discrete projectiles from a paintball marker. This app again is highly specialized, was developed with support from HISC, but has not been institutionalized into operations due to departure of two of the defendant’s key collaborators.
7. *Geiger-BT*. This app was developed by the defendant to interface with a homemade Geiger counter, to monitor / record X-Ray exposure during experiments at UH related to characterizing effects of x-rays for control of invasive beetles (through use of a shielded field irradiator, or through sterile insect technique). The app was also used to attempt to calibrate the dose rate of in an x-ray imaging cabinet as a function of distance from source (and to measure beam attenuation in organic nesting materials), but this was unsuccessful due to limitations in the latency of the Geiger tube, and execution of these tasks required the defendant to borrow a high quality NIST calibrated radiation meter from a collaborator in Davis CA. The defendant is the only person to ever use this app, or who probably ever will use it.
8. *Trap Light Interface*. This app was developed to facilitate programming of custom designed lighting circuits by non-engineer collaborators at other Universities. The miniature (rechargeable) battery operated lights are designed to be incorporated into customized insect traps, to investigate lighting preferences for improving trap efficacy. The app can control any of six unique LED lights (UV, blue, green, yellow, amber, or red), alone or in combination, to illuminate at different periods of night or day in relation to system measured sunset and sunrise times, with different intensities and or modulation (i.e. pulsing or sinusoidal variation in intensity). Again, this app is highly specialized, requires a custom circuit, and was written for research funded by USDA through the University of Hawaii, and was / is made freely available to collaborators).
9. *Flotation Interface*. This app was developed exclusively for research use on one of the defendants UH projects. It interfaces to a custom designed handheld cartridge, and controls the electrical characteristics and duration of current applied through sets of electrode arrays designed to generate microbubbles by electrolysis

and capture and eject concentrated bacteria from disperse suspensions into an eluent (so that the bacteria can be more easily detected / enumerated). Noone has ever used this app except for the defendants lab and a handful of collaborators for whom his lab built additional cartridges.

10. *PRG Incubator*. Several versions of this app have been developed, to support research needs of the defendant at his lab at the University of Hawaii. One provides a graphical interface to control and record temperatures in incubators that could easily be improvised in the field with items from a typical grocery or drug store (to help enrich bacterial contaminants on food and water to facilitate detection / enumeration), another overrides controls on a commercial incubator and enable dynamic (variable over time following desired profiles) temperature control (including recording of actual temperatures to ensure quality control). Each implementation was highly specific to unique needs in the defendants research program(s).

#### **Custom Hardware / Instrumentation (In Use Outside of PIs Lab)**

11. *BioRanger<sup>TM</sup>*: Handheld instrument for real-time / quantitative isothermal nucleic acid based amplification.
12. *ABE-Stat*: Palm sized high performance open-source potentiostat for versatile electrochemical measurements.
13. *Trap Light Mini*: Miniature field deployable multicolor LED array for testing insect lighting preferences for effective trapping (6 colored LEDs can individually be programmed to illuminate in several diurnal patterns based on observed daylight durations, with ability to modulate in different ways and with different frequencies).
14. *GBT-TS*: Miniature instrument to dynamically record and display origin and trajectory of projectiles with herbicide, deployed from aircraft systems to control incipient invasive plants in remote landscapes.
15. *Electroflotation Cartridge*: Handheld cartridge to enable electroflotation based concentration and recovery of pathogenic microorganisms from environmental water samples.
16. *Bee pheromone sprayer*: Field deployed device to automatically actuate a small pump for volatile bee alarm pheromones to deter wild elephants from human populated / cultivated areas.

#### **Patent Filings**

17. Sensor for components of a fluid (US Patent No. 6,287,851, awarded September 2001).
18. Sensor for analyzing components of fluids (US Patent No. 6,733,984, awarded 2004).
19. Disposable Electrode for Detection of Selected Nucleic Acid Sequences (disclosure, September 2005; utility patent filed September 2006).
20. A simple, rapid, and inexpensive circuit for direct measurement of luminescent lifetimes (disclosure, October 2006).
21. Automatic flush trigger for toilet-trained cats (utility patent filed January 2010).
22. Real-time isothermal sequence specific detection of DNA with non-contact temperature controller (disclosed January 2010 - Utility patent filed June 2011/ PCT/US2011/041540).
23. Sequence specific real-time monitoring of Loop Mediated Isothermal Amplification (LAMP). Disclosed June 2010. US application US61/357,428, international patents pending application WO2011163425A1)
24. Real-time microalgae harvesting efficiency monitoring system (disclosed September 2013). Integrated global position system logging system for electro-pneumatic delivery applications (utility patent filed May 2014).
25. Hardware and mobile software for operation of portable instruments for nucleic acid amplification (design patent filed August 2014, US Patent Application 14/914,571).
26. Hardware and mobile software for operation of portable instruments for nucleic acid amplification (2019, US Patent Application 10/203,284).
27. Point-of-care electroflotation of dispersed, low tolerance pathogens (disclosed July 2018; utility patent application filed July 2019 206339-0007-00WO).

Leadership Roles (Committees, Boards, Advisory, etc.)

- Search Committee, 2 BE faculty positions, MBBE, 2020
- UH Manoa Tenure and Promotion Review Committee Chair, 2019
- CTAHR Faculty Senate (Research Committee), 2019 – 2021
- ASABE Information Technology, Sensors, and Control Systems (ITSC) Community Chair, 2020
- ASABE Information Technology, Sensors, and Control Systems (ITSC) Programming Chair, 2019 Annual International Meeting
- Multistate / NIMMS Project NC-1194 (Nanotechnology and Biosensors) rotating secretary / vice chair / chair, 2017 – 2020; 2010 – 2013
- ASABE Biosensors Committee Officer (rotating secretary / vice chair / chair), 2016 – 2019, 2007 – 2010
- MBBE Department Personnel Committee, 2015 – 2017 (committee chair for 2015 / 2016)
- MBBE Search Committee, Junior Specialist, BE program, 2016 / 2017
- UH Manoa Tenure and Promotion Review Committee, 2016
- CTAHR Faculty Senate Chair (2014/ 2015 Academic Year)
- Search Committee, CTAHR Associate Dean for Research (2014)
- Chair/ Local Host/ co-Organizer, Multi State Project NC-1194 (Nanotechnology and Biosensors) annual meeting, held in conjunction with IEEE-NEMS, Waikiki, April 13 - 16, 2014
- CTAHR Faculty Senate Executive Committee Secretary (Fall 2012 - Spring 2014)
- Manoa Assessment Committee, (2011 - 2014)
- UH Manoa Faculty Senate, (2009 - 2011), served on Committee for Academic Policy and Planning.
- Biological Engineering Program Chair, (2004 - 2011). Managed program, course scheduling, program meetings, and interfaced with Industry Advisory Board for program to make sure program maintained currency and relevancy. Shepherded program through internal program review (2007) and reaccreditation by ABET (2009)
- Biological Engineering Academic Advisor, (2004 - 2011)- for all undergraduate Biol. Engr. majors
- De Facto Assessment Chair, Biological Engineering Program, (2007 - 2011), largely devised and implemented comprehensive assessment process to ensure continuous improvement, and ensure compliance with ABET expectations for program accreditation.
- CTAHR Faculty Senate, (2007 - 2009).
- Manoa Distance Learning Committee (2006).

**Graduate Students**

<u>Category</u>	<u>Current Number of Students</u>	<u>Number Graduated (Career)</u>
<i>Chair of Master’s Committees</i>		5
<i>Chair of PhD Committees</i>	2	1
<i>Member of Master’s Committees</i>		7
<i>Member of PhD Committees</i>		8

**Grant Support**

Title of Grant: Unmanned Aerial System (UAS) based precision pesticide delivery systems for invasive species management in Hawaii

Source of Grant: Hawaii Department of Agriculture

Total Dollar Value (Your share of the grant value): \$78,669

Dates of Grant: February 1, 2020 – January 31, 2021

Role (PI, CoPI): PI

Title of Grant: Building Research and Technology Capacity for Herbicide Ballistic Technology on Unmanned Aircraft Systems

Source of Grant: Hawaii Invasive Species Council



Total Dollar Value (Your share of the grant value): \$58,493

Dates of Grant: 2018 - 2021

Role (PI, CoPI): PI

Title of Grant: Integrating Herbicide Ballistic Technology with Unmanned Aircraft Systems for enhancing invasive plant species management

Source of Grant: USFS-STDP

Total Dollar Value (Your share of the grant value): \$126,448

Dates of Grant: 2017 - 2019

Role (PI, CoPI): coPI

Title of Grant: Physical approaches for detection and control of Coconut Rhinoceros Beetle

Source of Grant: USDA-APHIS

Total Dollar Value (Your share of the grant value): \$106,699

Dates of Grant: 2016 - 2018

Role (PI, CoPI): PI

Title of Grant: Fluidics Card For Portable Agricultural Diagnostic Panel

Source of Grant: USDA-SBIR

Total Dollar Value (Your share of the grant value): \$98,872

Dates of Grant: 2016

Role (PI, CoPI): de-facto PI

Title of Grant: Rapid on-site molecular diagnostics for select agent *Ralstonia solanacearum*

Source of Grant: USDA-APHIS

Total Dollar Value (Your share of the grant value): \$57,316

Dates of Grant: 2015-2016

Role (PI, CoPI): PI

Title of Grant: Characterization of Liberibacter populations and development of field detection system for citrus huanglongbing

Source of Grant: USDA-SCRI

Total Dollar Value (Your share of the grant value): \$248,519

Dates of Grant: 2014-2019

Role (PI, CoPI): PI

Title of Grant: New Engineered Approaches for Recovering Disperse Populations of Low-Tolerance Pathogens from Food

Source of Grant: USDA-AFRI

Total Dollar Value (Your share of the grant value): \$498,413

Dates of Grant: 2014-2018

Role (PI, CoPI): PI

#### **Presentations at Conferences (last 10 years)**

Title: Disruptive technologies in disaster and resiliency management.

Authors (put an asterisk on the presenter): D. M. Jenkins\*

Name of Conference: Future Focus Conference

Location: Waikiki, HI

Date of Presentation: October 15, 2019

Title: ABE-Stat II: New applications and upgraded hardware for improved performance

Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. McLamore, S. Jun, and J. Reyes-de-Corcuera

Name of Conference: ASABE International Meeting

Location: Boston, MA

Date of Presentation: July 10, 2019

Title: Image-based automated trap surveillance for Coconut Rhinoceros Beetle  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, M. Melzer  
Name of Conference: ASABE International Meeting  
Location: Boston, MA  
Date of Presentation: July 9, 2019

Title: A novel loop-mediated isothermal amplification (LAMP) assay using Cycling Probe and RNaseH II can detect SNPs determining races in *Fusarium oxysporium* sp.  
Authors (put an asterisk on the presenter): L. Diaz\*, R. Kubota, D. M. Jenkins  
Name of Conference: ASABE International Meeting  
Location: Boston, MA  
Date of Presentation: July 8, 2019

Title: Evaluating lighting preferences to enhance trapping efficacy of Asian Citrus Psyllid  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Kubota, M. Roose, M. Keremane, C. Ramadugu  
Name of Conference: International Research Conference for HuangLongBing (IRCHLB)  
Location: Riverside, CA  
Date of Presentation: March 12, 2019

Title: ABE-Stat: A palm-sized, wireless, open-source potentiostat for high-performance electrochemical measurements  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. McLamore, S. Jun, J. Reyes-de-Corcuera  
Name of Conference: IEEE Nanomed  
Location: Waikiki, HI  
Date of Presentation: December 3, 2018

Title: Decision support for food safety / security, and conservation of natural resources.  
Authors (put an asterisk on the presenter): D. M. Jenkins\*  
Name of Conference: Future Focus Conference  
Location: Waikiki, HI  
Date of Presentation: October 10, 2018

Title: ABE-Stat: A palm-sized, wireless, open-source potentiostat for high-performance electrochemical measurements  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. McLamore, S. Jun, J. Reyes-de-Corcuera  
Name of Conference: AiMES Joint ECS and SMEQ International Meeting  
Location: Cancún, Mexico  
Date of Presentation: October 2, 2018

Title: Evaluation of lighting preference to enhance trap catch of Asian Citrus Psyllid and Coconut Rhinoceros Beetle  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Kubota, M. Roose, M. Keremane, C. Ramadugu, M. Melzer, S. Watanabe  
Name of Conference: ASABE International Meeting  
Location: Detroit, MI  
Date of Presentation: July 31, 2018

Title: ABE-Stat: A palm-sized, wireless, open-source potentiostat for high-performance electrochemical measurements  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. McLamore, S. Jun, J. Reyes-de-Corcuera  
Name of Conference: ASABE International Meeting  
Location: Detroit, MI  
Date of Presentation: July 31, 2018

Title: Evaluation of x-ray irradiation as a non-chemical method of control and management of Coconut Rhinoceros Beetle  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Haff, S. Watanabe, M. Melzer

Name of Conference: ASABE International Meeting  
Location: Detroit, MI  
Date of Presentation: July 31, 2018

Title: ABE-Stat: A palm-sized, wireless, open-source potentiostat for high-performance electrochemical measurements

Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. McLamore, S. Jun, J. Reyes-de-Corcuera

Name of Conference: Gordon Research Conference for Nanoscale Science and Engineering for Agriculture and the Environment

Location: South Hadey, MA

Date of Presentation: June 3, 2018

Title: Recovery of concentrated microbial pathogens using a portable electroflotation system

Authors (put an asterisk on the presenter): L. Diaz\*, D. M. Jenkins, T. R. Tzeng, T. McNealy.

Name of Conference: ASABE Annual International Meeting

Location: Orlando, FL

Date of Presentation: July 19, 2016

Title: A low-cost portable platform for ag diagnostics

Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Kubota.

Name of Conference: ASABE Annual International Meeting

Location: Orlando, FL

Date of Presentation: July 20, 2016

Title: A general purpose wireless data acquisition and control system with flexible Android interface

Authors (put an asterisk on the presenter): D. M. Jenkins\*, J. Reyes-de-Corcuera.

Name of Conference: ASABE Annual International Meeting

Location: Orlando, FL

Date of Presentation: July 19, 2016

Title: Rapid recovery and concentration of bacterial pathogens using portable electroflotation cartridge

Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. Horowitz, T. McNealy.

Name of Conference: ASABE Annual International Meeting

Location: New Orleans, LA

Date of Presentation: July 27, 2015

Title: A custom GPS recording system for improving operational performance of aerially-deployed herbicide ballistic technology

Authors (put an asterisk on the presenter): R. Rodriguez\*, J. Leary, B. Mahnken, D. M. Jenkins

Name of Conference: ASABE Annual International Meeting

Location: Montreal, Canada

Date of Presentation: July 14, 2014

Title: Portable diagnostic platform for real-time LAMP based typing of *Ralstonia solanacearum* in the field

Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Kubota, A. Alvarez, C. Allen

Name of Conference: ASABE Annual International Meeting

Location: Montreal, Canada

Date of Presentation: July 14, 2014

Title: Nanoparticle assisted biofilm disruption and recovery of food-borne pathogens using electroflotation

Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. Horwitz, T. McNealy

Name of Conference: ASABE Annual International Meeting

Location: Montreal, Canada

Date of Presentation: July 14, 2014

Title: Nanoparticle assisted biofilm disruption and recovery of food-borne pathogens using electroflotation

Authors (put an asterisk on the presenter): D. M. Jenkins\*, E. Horwitz, T. McNealy  
Name of Conference: IEEE Nano/ micro Engineered and Molecular Systems Conference  
Location: Waikiki, HI  
Date of Presentation: April 14, 2014

Title: Non Instrumented Nucleic Acid Amplification (NINA) for rapid detection of food and agricultural pathogens  
Authors (put an asterisk on the presenter): D. M. Jenkins\*, R. Kubota  
Name of Conference: International Symposium on Applications of Nanotechnology and Biosensors for Agriculture and Food  
Location: Hangzhou, China  
Date of Presentation: April 14, 2011

Title: Simple, rapid, and specific DNA-based diagnostics for detection of the bacterial wilt pathogen *Ralstonia solanacearum* race 3 biovar 2  
Authors (put an asterisk on the presenter): R. Kubota\*, D. M. Jenkins, A. Alvarez, C. Allen  
Name of Conference: Annual International Meeting of the American Phytopathology Society  
Location: Nashville, TN  
Date of Presentation: August 9, 2010

Title: Sequence specific real-time monitoring of loop-mediated isothermal amplification (LAMP) using FRET-based probe for detection of the bacterial wilt pathogen *Ralstonia solanacearum* race 3 biovar 2  
Authors (put an asterisk on the presenter): R. Kubota\*, D. M. Jenkins, A. Alvarez, C. Allen  
Name of Conference: Annual International Meeting of the American Phytopathology Society  
Location: Nashville, TN  
Date of Presentation: August 9, 2010

Title: Engineering a real-time disposable platform for discrimination of sub-populations of *Ralstonia solanacearum*  
Authors (put an asterisk on the presenter): R. Kubota\*, D. M. Jenkins, A. Alvarez, C. Allen  
Name of Conference: ASABE Annual International Meeting  
Location: Reno, NV  
Date of Presentation: 2009

Title: Design and performance of automated flushing systems for toilet trained cats  
Authors (put an asterisk on the presenter): D. M. Jenkins\*  
Name of Conference: ASABE Annual International Meeting  
Location: Reno, NV  
Date of Presentation: 2009

Title: Application of molecular beacons for the sequence specific confirmation and direct detection of Loop-mediated isothermal AMPLification (LAMP) amplicons from the bacterial wilt pathogen *Ralstonia solanacearum*  
Authors (put an asterisk on the presenter): R. Kubota\*, D. M. Jenkins, A. Alvarez, C. Allen  
Name of Conference: Annual International Meeting of the American Phytopathology Society  
Location: Portland, OR  
Date of Presentation: 2009