



Sand grains in red solution as seen through a confocal microscope

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BEE Faculty



Daniel Aneshansley, Ph.D.
Associate Professor
[Profile and CV](#)

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Bioinstrumentation, bioengineering

Biography

Aneshansley joined the Department of Biological and Environmental Engineering in 1984 after holding joint appointments in the School of Electrical Engineering and the Section of Neurobiology and Behavior at Cornell. He has also worked for the National Cash Register Company and the electronics division of Borg Warner. His teaching interests are in the areas of instrumentation, digital and analog circuit design, and the application of personal computers to the laboratory environment; he developed an introduction to microprocessors for AT&T Bell Laboratories that has been used at seven universities. Aneshansley has also collaborated with Thomas Eisner on research that has been the subject of six television programs, including "Discover" on commercial television, shows airing on PBS, the BBC, and Canadian television, and a National Geographic special. He is a member of the American Society of Agricultural Engineers, the Institute of Electrical and Electronics Engineers, the American Society for Engineering Education, the Society of Manufacturing Engineers, and the Instrument Society of America. He is also a member of the honorary societies Sigma Xi, Tau Beta Pi, and Eta Kappa Nu.

Research Interests

"Biological engineering and instrumentation-the development of sensors, signal-conditioning circuits, and data-acquisition equipment-are the focus of our research. The application of electronics and computers to the problems of automated data collection in the agricultural environment is of particular interest. This work includes sensing the reproductive state of an animal as well as measuring production variables and monitoring physiological parameters related to animal health. Current projects include collaborative studies on the effects of transient contact voltages on livestock, evaluation of the presence of transient voltages on farmsteads, and development of instrumentation to measure these transient voltages. Another area of activity is the development of nondestructive testing techniques for grading and inspecting agricultural products.

Biological engineering studies have examined how insects and plants solve engineering problems of defense and communication. Examples are of thin-film structures for production of ultraviolet patterns, micro-chemical explosions to propel defensive secretions, and mechanisms of attachments. More recent studies have examined ion flow and water flow across membranes and the development of electroporation

techniques to mediate water transfer from cells during cryopreservation".

Current Research Projects

Design of a Prototype In-line Inspection System for Apples (*U.S. Department of Agriculture/Agricultural Research Service Cooperative Agreement*)

| Other participant: J. A. Throop, research support specialist.

National Needs Doctoral Fellowships: Animal Biological Engineering (*U.S. Department of Agriculture*)

| Other participants: S. G. Capps and R. E. Pitt, faculty members

Effect of Electroporation on Permeation of Cryoprotectants and Water across Membranes of Biological Cells (*National Science Foundation*)

| Other participant: R. E. Pitt, faculty member

Continuing Studies in Stray Voltage: Effects of Transient Waveforms and Multiple Stresses (*Empire State Electric Energy Research Co.*)

| Other participants: R. C. Gorewit (animal science) and D. C. Ludington, faculty members

Control of Cryptosporidium by Composting

Professional CV

Academic Degrees

- Ph.D., Electrical Engineering, Cornell University, 1974
- M.S., Electrical Engineering, Cornell University, 1968
- B.S.E.E., Electrical Engineering, University of Cincinnati, 1965

Fields of Specialization and Special Interest

- Agricultural and Biological Engineering
- Electronic Instrumentation - Sensors and Signal Conditioning
- Computer Data Acquisition and Control Applications

Professional Experience

Cornell University

- Associate Professor, Dept. of Agricultural and Biological Engineering, 1985 - present
- Sr. Research Associate, Dept. of Agricultural Engr., 1984 - 1985
- Act. Assoc. Prof., School of Electrical Engineering, Sr. Res. Assoc., Sect. of Neurobiology & Behavior, 1980 - 1984
- Lecturer, School of Electrical Engineering, Res. Assoc., Sect. of Neurobiology & Behavior, 1978 - 1980
- Act. Assistant Prof., School of Electrical Engr., Res. Assoc., Sect. of Neurobiology & Behavior, 1976 - 1979
- Instructor, School of Electrical Engineering, Res. Assoc., Sect. of Neurobiology & Behavior, 1972 - 1976
- Instructor, School of Electrical Engineering, 1970 - 1972

Consulting Work and Industrial/Educational Experience

Engineering:

- Consultant in area of Stray Voltage (1991 - present)
- MicroAg, Consultant (1990)
- Optium Ag, Consultant (1986 - 1988)
- Borg Warner Electronics, Consultant (1978 - 1982)

Science and Mathematics Education Consulting:

- Children's Television Workshop (1978, 1979)
- Mountainview Center for Environmental Education (1970)
- East Hill Elementary School (1969)
- DeWitt Junior High School (1968)
- Cornell University's Upward Bound Project (1967)

Professional Activities

Professional Certification:

- Passed Ohio EIT Exam (1965)

Professional Organizations:

- American Society of Agricultural Engineers (now ASAE)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Society for Engineering Education (ASEE)
- Instrument Society of America (now ISA)

Professional Honors and Awards:

Honorary Societies:

- Sigma Xi, Tau Beta Pi, Eta Kappa Nu, Gamma Sigma Delta
 - Schlumberger Foundation Fellowship
- NDEA Title IV Traineeship

Professional Committees/Activities:

- ASAE Electric and Electronic Systems
 - Associate Editor (1989 - 1993, 1995)
- ASAE Milking Handling Equipment Committee, EES-41/IET-441
 - Secretary (1988, 1999 - 2000), Vice Chairman (1989)
 - Chairman (1990), Past Chairman (1991)
- IEEE Adv. Comm. on Microcontroller System Serial Control Bus (1988 - 1999)
- ESCOP Subcommittee on Sensor Technology for Agriculture (1987)
- Sigma Xi
 - Nominating Committee (1987 - 1989)
 - Finance Committee (1990 - 1993)
- Reviewer: Jour. of Animal Sciences, Amer. Soc. Civil Engr., ASAE,
 - USDA-Small Business Initiation Research Grants
- NE179: Non-Destructive Quality Measurement in Fruits and Vegetables.
 - Board Member At-Large (1995)
 - Secretary (1996)

- Chair (1997)
- Conference on Sensors for Nondestructive Testing: Measuring the Quality of Fresh Fruits and Vegetables, Program Committee in charge of Funding (Feb. 1997)

University Activities

- Ad Hoc Committee on Master of Environmental Management (1991 - 1993)
- Promotion Review Committees
 - College of Engineering (1991)
 - College of Human Ecology (1993)
 - College of Agricultural and Life Science (1995)
- Health Careers Evaluation Faculty (1992 - 1995)

College of Engineering Activities

- Fac. Rep. for Master of Engineering Program (1987 - 1993)
- Master of Engineering Financial Aid Subcommittee (1989 - 1993)
- Master of Engineering Rules and Policies Subcomm. (1989 - 1993)
- Process Control Laboratory Steering Committee (1988 - 1989)
- CCGB Subcommittee on Computing Applications (1988 - 1989)
- Committee on Electronic Technology (1992 - 1993)
 - Subcommittee on Learning Resource Technology - Co-chair
- Mentor SuperQuest Institute for High School Students (1993)
- Computing Policy Committee (1993 - present)
- Ad Hoc Committee on Bioengineering (1993)
- Committee on Bioengineering (1994 - 1996)

Department Activities

- Director of Graduate Studies (1999 - present)
- Committee on Academic Programs (1990 - 1994)
- Social Committee (1990 - 1992)
- Food and Biol. Engr. Lab. Coordinator (1990 - 1995)
- Graduate Coordinating Committee (1987 - 1993, 1996 - present)
- Ad Hoc Working Group of Graduate Coordinating Committee(1991)
- Liaison with Mann (89-92) and Carpenter Libraries (1990 - 1993)
- Com. on Plan. and Utilization of Physical Resources (1990 - 1993)
- Planning for the '90s Committee
- Strategic Planning Committee (1992 - 1994)
- Center for the Environment Subcommittee on MEM (1994)
- Co-Advisor to ASAE Student Branch (1994 - 1999)
- Advisor to Graduate Student Association (1999 - present)

Instruction: (Courses, 1981 - Present)

- ABEN 652 Sensors and Instrumentation, (1985 - 1996, 1999 - present)
- ABEN 450 Instrument Design, (1988 - present)
- ABEN 701 Machine Vision Applications, (1990, 1994)
- ABEN 200 Undergraduate Seminar (1 lec), (1987 - 1993)
- ABEN 551-2 MENG Design Project (Coordinator), (1987 - present)
- AS 341 Physiology of Lactation (1 lab), (1991 - 1993)
- ABEN 496 Capstone Design (Project Adviser), (1993 - present)
- ABEN 497 Special Topics in ABEN, (1993 - present)
- ABEN 454 Physiological Engineering (1 lab), (1994 - 1998)

- ABEN 454 Physiological Engineering (co-taught), (1999 - present)
- ABEN 151 Introduction to Computing, (1994 - 1997)
- Cornell Agricultural Energy Program's Workshop on Stray Voltage, Instructor, (1994 - present)

Personal

- Past President and Secretary of Advocates for the Handicapped
- Past Board member of Shot-in-the-Dark
- Certified Special Olympic Coach (Aquatics & Bowling) (1993 - present)
- Head Special Olympics Bowling Coach (1995 - present)
- President of Glenside Neighborhood Association (1995 - present)

Publications

Books or Chapters in Books and Special Publications

1. Scott, N.R. and D.J. Aneshansley. 1991. Radio Telemetry. Chapter in "Instrumentation and Measurement for Environmental Sciences", by Henry, Zoerb and Birth. Published Aug. 1, 1991 by American Society of Agricultural Engineers.
2. Aneshansley, D.J. and R.C. Gorewit. 1991. Chapter 3: Physiological Effects in "Effects of Electrical Voltage/Current on Farm Animals: How to Detect and Remedy Problems." US Department of Agriculture, Agricultural Research Service, Handbook 696, A. Lefcourt, Ed. (Dec. 1991)
3. Aneshansley, D.J., H.A. Affeldt, G.H. Bruswitz, P. Chen, M.J. Delwiche, K. Peleg, S. Searcy, N. Singh, J.A. Throop, B.L. Upchurch, B. Zion. 1994. Detecting Surface Defects (Wounds, Bruises and Decay). In "Non Destructive Technologies for Quality Evaluation of Fruits and Vegetables". ASAE Special Publication No. 5-94. pp. 72-79. ASAE, St. Joseph, MI. 49085-9659
4. Upchurch, B.L., H.A. Affeldt, D.J. Aneshansley, G.S. Birth, R.P. Cavalieri, P. Chen, W.M. Miller, Y. Sarig, Z. Schmilovitch, J.A. Throop, E.W. Tollner. 1994. Detection of Internal Disorders. In "Non Destructive Technologies for Quality Evaluation of Fruits and Vegetables". ASAE Special Publication No. 4-94. pp. 80-85 ASAE, St. Joseph, MI. 49085-9659
5. Aneshansley, D.J., J.A. Throop & B.L. Upchurch. 1997. Reflectance Spectra of Surface Defects on Apples. In Sensors for Nondestructive Testing: Measuring the Quality of Fresh Fruits and Vegetables. Northeast Regional Agricultural Engineering Service Publication No. 97, Ithaca, N.Y. 14853.
6. Throop, J.A., D.J. Aneshansley, B.L. Upchurch. 1997. Apple Orientation on Automatic Sorting Equipment. In Sensors for Nondestructive Testing: Measuring the Quality of Fresh Fruits and Vegetables. Northeast Regional Agricultural Engineering Service Publication No. 97, Ithaca, N.Y. 14853.

Referred

1. Storey, G.K., D.J. Aneshansley, T. Eisner. 1991. Parentally-provided alkaloid does not protect eggs of Utetheisa ornatrix (Lepidoptera: Arctiidae) against entomopathogenic fungi. Jour. Chemical Ecology 17(4):687-693 (Mar. 1991)
2. Eisner, T., A.B. Attygalle, M. Eisner, D.J. Aneshansley, and J. Meinwald. 1991. Chemical Defense of a Primitive Australian Bombardier Beetle: Mystropomus regularis. Chemoecology 2(1991):29-34.
3. Gorewit, R.C., D.J. Aneshansley and L.R. Price. 1992. Effects of Voltages on Cows over a Complete Lactation. 1. Milk Production and Composition. J. Dairy Sci. 75:2719-2725.
4. Gorewit, R.C., D.J. Aneshansley and L.R. Price. 1992. Effects of Voltages on Cows over a Complete Lactation. 2. Health and Reproduction. J. Dairy Sci. 75:2726-2732.
5. Aneshansley, D.J. and R.C. Gorewit. 1992. Cow Sensitivity to Electricity During Milking. J. Dairy Sci. 75:2733-2741.
6. Pannabecker, T.L., D.J. Aneshansley and K.W. Beyenbach. 1992. Unique Electrophysiological Effects of Dinitrophenol in Malpighian Tubules. Amer. Jour. Physiol. 263(3 Part 2).1992.R607-R614.

7. Chen, S., M.B. Timmons, D.J. Aneshansley, J.J. Bisogni, Jr. 1992. Bubble Size Distribution in a Column Applied to Aquaculture System. *Aquacultural Engineering* 11 (1992):267-280.
8. Liu, Y., D.J. Aneshansley, J.R. Stouffer. 1993. Autocorrelation of Ultrasound Speckel and Its Relationship to Beef Marbling. *Trans. ASAE* 36(3):971-977
9. Beyenbach, K.W., A. Oviedo and D.J. Aneshansley. 1993. Malpighian Tubules of *Aedes Aegypti*: Five Tubules, One Function. *J. Insect Physiol.* 39(8):639-648.
10. Gorewit, R.C., J. Jiang and D.J. Aneshansley. 1993. Responses of the Bovine Mammary Artery to Angiotensins. *Jour. Dairy Sci.*76:1276-1284
11. Chen, S., M.B. Timmons, J.J. Bisogni, Jr., D.J. Aneshansley 1993. Suspended solids removed by foam fractionation. *The Progressive Fish-Culturist* 55(2):69-75.
12. Chen, S., M.B. Timmons, J.J. Bisogni, Jr., D.J. Aneshansley 1993. Protein and its removal by foam fractionation. *The Progressive Fish-Culturist* 55,(2):76-82.
13. Chen, S., M.B. Timmons, D.J. Aneshansley, J.J. Bisogni, Jr. 1993. Suspended Solids Characteristics from Recirculating Aquacultural Systems and Design Implications. *Aquaculture*, 112(1993)143-155.
14. Koelsch, R.K., D.J. Aneshansley, and W.R. Butler. 1994. Analysis of Activity Measurement for Accurate Estrus Detection in Dairy Cattle. *Jour. Agr. Engr. Res.* (1994)58:107-114.
15. Koelsch, R.K., D.J. Aneshansley, and W.R. Butler. 1994. Milk Progesterone Sensor for Application with Dairy Cattle. *Jour. Agr. Engr. Res.* (1994)58:115-120
16. Throop, J.A., D.J. Aneshansley, B.L. Upchurch. 1994. Effects of camera systems on detecting watercore in Red Delicious apples. *Trans. ASAE.* 37(3):873-877.
17. Chen, S., M.B. Timmons, J.J. Bisogni, Jr., D.J. Aneshansley 1994. Modeling Surfactant Removal in Foam Fractionation I: Theoretical Development. *Aquacultural Engineering* 13(1994):163-181.
18. Chen, S., M.B. Timmons, J.J. Bisogni, Jr., D.J. Aneshansley 1994. Modeling Surfactant Removal in foam Fractionation II: Experimental Investigations. *Aquacultural Engineering* 13(1994):183-200.
19. Throop, J.A., D.J. Aneshansley and B.L. Upchurch. 1994. Camera system effects on detecting watercore in ' Red Delicious' apples. *Trans. of ASAE* 37(3):873-877.
20. Upchurch, B.L., J.A. Throop and D.J. Aneshansley. 1994. Influence of time, bruise-type, and severity on near-infrared reflectance from apple surfaces for automatic bruise detection. *Trans. of ASAE* 37(5):1571-1575.
21. Chandrasekaran, M, R.E. Pitt, D.J. Aneshansley and J.E. Parks. 1995. Effect of Electroporation on Intracellular Ice Formation in Rye Leaf Protoplasts. *Cryobiology* 32: 461-476 (1995).
22. Throop, J. A., D.J. Aneshansley and B.L. Upchurch. 1995. An Image Processing Algorithm to Find New and Old Bruises. *ASAE Trans.* 11(5):751-757.
23. Upchurch, B.L., J.A. Throop, and D.J. Aneshansley. 1996. Detecting internal breakdown in apples using interactance measurements. *Postharvest biology and Technology* 10(1997):15-19.
24. Eisner, T. and D.J. Aneshansley. 1999. Spray aiming in the bombardier beetle: Photographic evidence. *PNAS* 1999 96:9705-9709

In Press

- Beyenbach, K.W., D.J. Aneshansley, T.L. Pannabecker, R. Masia, D. Gray and M. Yu. 1999. Oscillations of Voltage and Resistance in Malpighian tubules of *Aedes aegypti*.

Patents Issued/Filed

1. Guo, G., D.C. Ludington, R. Pellerin, D.J. Aneshansley. Two-Level Vacuum System with Feedback. U.S. Patent No. 5,141,403 (Issued August 25, 1992)
2. Guo, G., R.A. Pellerin, D.C. Ludington, D.J. Aneshansley. Controlling vacuum level with a two-level vacuum system controller with adjustable speed drive. United States Patent #5,284,180. Issued February 8, 1994.
3. Petersson, L. and D.J. Aneshansley. Milking claw ferrule aperture and sanitizing methodology. United States Paten # 5,345,890. Issued September 13, 1994).
4. Throop, J. A., Aneshansley, D. J., Upchurch, B. L. 1996. Fruit orienting device. U.S.

Patent Application. Serial Number 08/491,805.

5. Throop, J. A., Aneshansley, D. J., Upchurch, B. L. 1996. Fruit orienting device. U.S. Patent Application. Serial Number 08/735,511.

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