



# Draper Education Activities



*"To perform and contribute to the support and advancement of scientific research, technology, and development, and to initiate, maintain, and engage in educational activities in the sciences and allied subjects."*

This is a key tenet of Draper's mission, rooted in its articles of incorporation. From its origins in MIT's Department of Aeronautics and Astronautics over 25 years ago, Draper Laboratory has strongly promoted and supported advanced technical education through numerous in-house, cooperative, and research programs with universities and colleges throughout the country. The Laboratory actively recruits graduate and undergraduate students to work on real, technical problems. Students have the opportunity to work on challenging projects from conception through development and implementation. The Education Office administers such programs as:

- **The Draper Fellow Program**
- **The Undergraduate Cooperative Program**
- **The Undergraduate Research Opportunities Program**

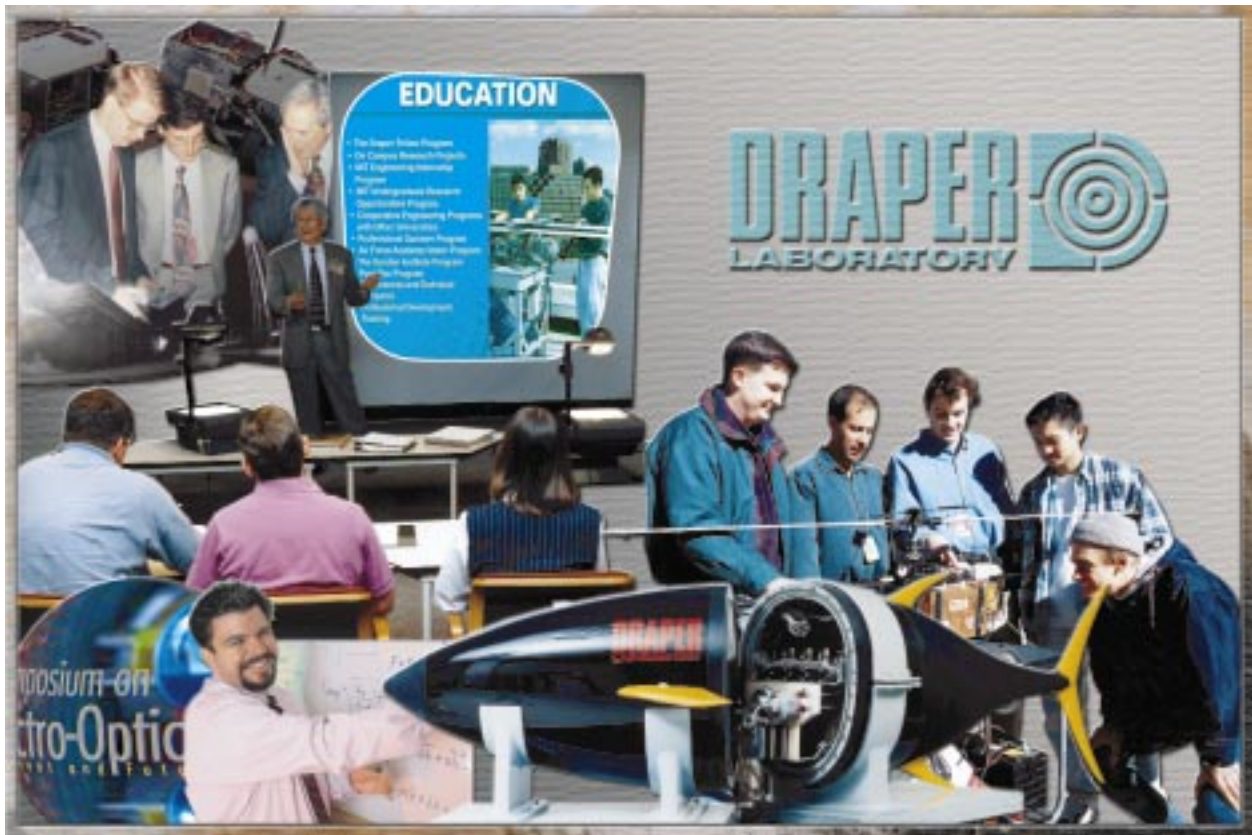
Other Education Office functions include administering:

- **The Professional Summer Program**
- **The Professional Development Training**
- **The Gordon Institute Program**
- **The University Research Program**
- **Conferences and Technical Symposia**
- **Publications**
- **Government Residents, Interns, and Associates**

1998 featured the *Symposium on Electro-Optics: Present and Future*, 23-24 April, cosponsored by Draper and MIT under the direction of Professor Hermann A. Haus. The symposium brought together research leaders in the field to assess new applications and to discuss promising research areas. The proceedings were published by the Optical Society of America. Also in 1998, Draper, along with the AIAA, the IEEE, and the Russian Academy of Navigation and Motion Control, sponsored the *5th Saint Petersburg International Conference on Integrated Navigation Systems* in May. Nearly 200 attendees from 60 organizations in 11 countries participated. In addition, the Draper-Sponsored University Research Program continued with nearly \$2,000,000 of Draper-funded efforts at various universities.

During 1998, the Draper Fellow program consisted of 57 students from MIT and several other universities. Several graduate theses were completed this year:

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| Optimization of a Micromechanical Single Element Oscillator Using Nonlinear Electrostatic Control<br><b>Kossuth, J.A.; Kourepenis, A.S.</b> (Supervisor)   | <b>Doctor of Philosophy Thesis, February 1998</b> |
| A Systematic Approach to Station-Keeping of Constellations of Satellites<br><b>Kantsiper, B.; Cefola, P.J.</b> (Supervisor)  | <b>Doctor of Philosophy Thesis, March 1998</b>    |
| The Evolution of Highly Eccentric Orbits<br><b>Fischer, J.D.; Proulx, R.J. &amp; Cefola, P.J.</b> (Supervisors)  | <b>Master of Science Thesis, June 1998</b>        |
| In-Flight Estimation of Environmental and Aerodynamic Modeling Errors for a GPS-INS Guided Artillery Shell in a GPS-Jamming Environment<br><b>Smith, M.W.; Thorvaldsen, T.P. &amp; Schmidt, G.T.</b> (Supervisors) | <b>Master of Science Thesis, June 1998</b>        |



- A Distributed Flight Control System Architecture for Small UAVs  
**Norris, R.B.; Kang, D.S.** (Supervisor) *Master of Science Thesis, June 1998*
- Force Magnifier Design in a Vibrating Structure  
**St. Michael, N.A.; Weinberg, M.S.** (Supervisor) *Bachelor of Science Thesis, May 1998*
- The Use of Foil Generated Vorticity as a Hover Actuator System for Undersea Vehicles  
**Marquardt, J.P.; Anderson, J.M.** (Supervisor) *Master of Science Thesis, June 1998*
- A Method to Analyze the Malignant Potential Colorectal Polyps Using Endoscopic Images  
**Emerson, M.J.; Pien, H.H.** (Supervisor) *Master of Science Thesis, May 1998*
- Guidance, Navigation and Control of a Robotic Fish  
**Gurunathan, M.; Anderson, J.M.** (Supervisor) *Master of Science Thesis, May 1998*
- Failure Detection and Isolation for the Space Shuttle Main Engine  
**Ho, N.T.; Mangoubi, R.S.** (Supervisor); **Hain, R.M.** (Supervisor) *Master of Science Thesis, May 1998*
- Man-Portable, Rocket-Propelled Surveillance Vehicle  
**Chhabra, A.; Kang, D.S.** (Supervisor) *Bachelor of Science Thesis, June 1998*
- An Intentional Database for the Timeliner Compiler  
**Petros, D.J.** *Bachelor of Science and Master of Engineering Thesis, May 1998*
- High Resolution Readout of Vibrating Island Accelerometer Using Digital Receiver  
**Chang, L.K.; Gardner, R.A.** (Supervisor) *Master of Science Thesis, May 1998*
- Real-Time Embedded Sensor Processing for an Autonomous Helicopter  
**Han, C.S.; DeBitto, P.A.** (Supervisor) *Master of Science Thesis, May 1998*
- Robust Control of a Flexible-Hull Propulsion System  
**Gadda, C.D.; Anderson, J.M.** (Supervisor) *Master of Engineering Thesis, May 1998*
- An Efficient, Wavelet Based, Variable Structure Network  
**Tilbury, C.A.; Cerrato, D.E.** (Supervisor) *Master of Science Thesis, June 1998*
- Helmet-Mounted Display Symbology for Ground Collision Avoidance in Fighter Aircraft  
**Taylor, J.B.; McNamara, T.** (Supervisor) *Master of Science Thesis, September 1998*
- A Unified Methodology for the Management of Time-Dependent Information in Aeronautical Systems  
**Atkins, S.C.; Adams, M.B.** (Supervisor) *Doctor of Philosophy Thesis, September 1998*
- Dynamics and Control of Hydraulically Actuated Robotic Fish-Like Propulsion  
**Di Pietro, A.P.; Anderson, J.M.** (Supervisor) *Master of Science Thesis, June 1998*
- A Three-Axis Rate Table Control System Model  
**Pileggi, R.; Musoff, H.** (Supervisor) *Master of Science Thesis, July 1998*
- A Predictor-Corrector Guidance Algorithm Design for a Low L/D Autonomous Re-Entry Vehicle  
**Haroz, C.; Neirinckx, P.J.** (Supervisor); **Battin, R.H.** (Supervisor) *Master of Science Thesis, December 1998*