Stanford



Stephen Rock

Professor of Aeronautics and Astronautics, Emeritus

CONTACT INFORMATION

- **Administrator**

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Bio

BIO

Professor Rock's research interests include the application of advanced control and modeling techniques for robotic and vehicle systems (aerospace and underwater). He directs the Aerospace Robotics Laboratory in which students are involved in experimental programs designed to extend the state-of-the-art in robotic control. Areas of emphasis include planning and navigation techniques (GPS and vision-based) for autonomous vehicles; aerodynamic modeling and control for aggressive flight systems; underwater remotely-operated vehicle control; precision end-point control of manipulators in the presence of flexibility and uncertainty; and cooperative control of multiple manipulators and multiple robots. Professor Rock teaches several courses in dynamics and control.

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Aeronautics and Astronautics
- Member, Bio-X

PROFESSIONAL EDUCATION

- PhD, Stanford University (1978)

Teaching

COURSES

2023-24

- Introduction to Control Design Techniques: ENGR 205 (Aut)

Publications

PUBLICATIONS

- **A hybrid underwater robot for multidisciplinary investigation of the ocean twilight zone.** *Science robotics*
  Yoerger, D. R., Govindarajan, A. F., Howland, J. C., Llopiz, J. K., Wiebe, P. H., Curran, M., Fujii, J., Gomez-Ibanez, D., Katija, K., Robison, B. H., Hobson, B. W., Risi, M., Rock, et al

2021; 6 (55)

- **A Pilot Aid for Real-Time Vision-Based Coverage Estimation for Seabed Surveying Applications**
  Mahajan, A., Rock, S., IEEE
  IEEE.2020
- **Mesobot: An Autonomous Underwater Vehicle for Tracking and Sampling Midwater Targets**
  Yoerger, D. R., Curran, M., Fujii, J., German, C. R., Gomez-Ibanez, D., Govindarajan, A. F., Howland, J. C., Llopiz, J. K., Wiebe, P. H., Hobson, B. W., Katija, K., Risi, M., Robison, et al
  IEEE.2018
- **Iceberg Wall Following and Obstacle Avoidance by an AUV**
  McEwen, R. S., Rock, S. P., Hobson, B., IEEE
  IEEE.2018
- **Online attitude determination of a passively magnetically stabilized spacecraft** *ACTA ASTRONAUTICA*
  Burton, R., Rock, S., Springmann, J., Cutler, J.
  2017; 133: 269-281
- **Mapping of Translating, Rotating Icebergs With an Autonomous Underwater Vehicle** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Kimball, P. W., Rock, S. M.
  2015; 40 (1): 196-208
- **Dual attitude and parameter estimation of passively magnetically stabilized nano satellites** *Acta Astronautica*
  Burton, R., Rock, S., M., Springmann, J., Cutler, J.
  2014; 94 (1): 145 - 158
- **Correlation of Sidescan Sonar Acoustic Shadows and Bathymetry for Terrain-Relative Navigation** *Unmanned Untethered Submersible Technology*
  Padial, J., Dektor, S., G., Rock, S., M.
  2013
- **Guidance Augmentation for Reducing Uncertainty in Vision-Based Hazard Mapping during Lunar Landing** *IEEE Aerospace, IEEE*
  Crane, E., S., Rock, S., M.
  2013
- **A Robust Framework for Failure Detection and Recovery for Terrain-Relative Navigation** *Unmanned Untethered Submersible Technology*
  Houts, S., E., Dektor, S., G., Rock, S., M.
  2013
- **Online Attitude Determination of a Passively Magnetically Stabilized Spacecraft**
  Burton, R., Rock, S., M., Springmann, J., Cutler, J.
  2013
- **Improving Robustness of Terrain-Relative Navigation for AUVs in Regions with Flat Terrain** *IEEE/OES Autonomous Underwater Vehicles Conference (AUV)*
  Dektor, S., Rock, S.
  IEEE.2012
- **Influence of Trajectory on Accuracy of Hazard Estimation During Lunar Landing**
  Crane, E., S., Rock, S., M.
  2012
- **Dual Attitude and Parameter Estimation of Passively Magnetically Stabilized Spacecraft**
  Burton, R., Rock, S., M., Springmann, J., Cutler, J.
  2012
- **Tumbling Target Reconstruction and Pose Estimation through Fusion of Monocular Vision and Sparse-Pattern Range Data** *IEEE MFI*
  Padial, J., Hammond, M., Augenstein, S., Rock, S., M.
  2012

- **A NEW METHOD FOR SIMULATING THE ATTITUDE DYNAMICS OF PASSIVELY MAGNETICALLY STABILIZED SPACECRAFT** *22nd AAS/AIAA Space Flight Mechanics Meeting*
  Burton, R., Starek, J., Rock, S.
  UNIVELT INC.2012: 967–980
- **Aggressive Terrain Following for Motion-constrained AUVs** *IEEE/OES Autonomous Underwater Vehicles Conference (AUV)*
  Houts, S. E., Rock, S. M., McEwen, R.
  IEEE.2012
- **Sonar-based iceberg-relative navigation for autonomous underwater vehicles** *DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY*
  Kimball, P., Rock, S.
  2011; 58 (11-12): 1301-1310
- **Hybrid Estimation Using Perceptional Information: Robotic Tracking of Deep Ocean Animals** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Plotnik, A., Rock, S.
  2011; 36 (2): 298-315
- **Improved Frame-to-Frame Pose Tracking during Vision-Only SLAM/SFM with a Tumbling Target** *IEEE International Conference on Robotics and Automation (ICRA)*
  Augenstein, S., Rock, S. M.
  IEEE.2011
- **OPTIMAL DESPIN OF A TUMBLING SATELLITE WITH AN ARBITRARY THRUSTER CONFIGURATION, INERTIA MATRIX, AND COST FUNCTIONAL** *20th AAS/AIAA Spaceflight Mechanics Meeting*
  Sheinfeld, D., Rock, S.
  UNIVELT INC.2010: 637–647
- **Estimation of Iceberg Motion for Mapping by AUVs**
  Kimball, P., Rock, S., M.
  2010
- **Closed-Loop Terrain Relative Navigation for AUVs with Non-Inertial Grade Navigation Sensors**
  Meduna, D., Rock, S., M., McEwen, R.
  2010
- **Development of a Programmable Rotational Motion Laboratory Demonstrator**
  Russell, S., P., Rock, S., M.
  2010
- **Spline-based Trajectory Planning Techniques for Benthic AUV Operations**
  Murthy, K., Rock, S., M.
  2010
- **Feedback Dual Controller Design and Its Application to Monocular Vision-Based Docking** *AIAA Guidance, Navigation, and Control Conference*
  Kim, J., Rock, S.
  AMER INST AERONAUT ASTRONAUT.2009: 1134–42
- **RIGID BODY INERTIA ESTIMATION WITH APPLICATIONS TO THE CAPTURE OF A TUMBLING SATELLITE** *AAS/AIAA 19th Space Flight Mechanics Meeting*
  Sheinfeld, D., Rock, S.
  UNIVELT INC.2009: 343–356
- **Performing Visual Surveys of Non-Planar Benthic Terrain**
  Murthy, K., Rock, S., M.
  2009
- **Particle Filtering Range Data for Pose Estimation under Torque-Free Motion**
  Russell, S., P., Rock, S., M.
  2009

- **AUV/ROV Pose and Shape Estimation of Tethered Targets without Fiducials**
  Augenstein, S., Rock, S., M.
  2009
- **Sonar-Based Iceberg-Relative AUV Localization** *UUST: Unmanned Untethered Submersible Technology*
  Kimball, P., Rock, S., M.
  2009
- **Simultaneous Estimation of Target Pose and 3-D Shape using the FastSLAM Algorithm**
  Augenstein, S., Rock, S., M.
  2009
- **Navigation for Performing Visual Surveys of Non-Planar Surfaces**
  Murthy, K., Rock, S., M.
  2009
- **AUV Terrain Relative Navigation Using Coarse Maps**
  Meduna, D., Rock, S., M., McEwen, R.
  2009
- **Control of a climbing robot using real-time convex optimization** *4th IFAC Symposium on Mechatronic Systems*
  Miller, T. G., Rock, S.
  PERGAMON-ELSEVIER SCIENCE LTD.2008: 301–13
- **Low-Cost Terrain Relative Navigation for Long-Range AUVs** *OCEANS 2008 Conference*
  Meduna, D. K., Rock, S. M., McEwen, R.
  IEEE.2008: 1643–1649
- **Estimating Inertial Position and Current in the Midwater** *OCEANS 2008 Conference*
  Augenstein, S., Rock, S.
  IEEE.2008: 1738–1743
- **Sonar-Based Iceberg-Relative AUV Navigation** *IEEE/OES Autonomous Underwater Vehicles Conference (AUV 2008)*
  Kimball, P., Rock, S.
  IEEE.2008: 20–25
- **Automatic ROV positioning services tethered ocean moorings - ROV is hovered automatically with respect to moving moored platform, while single pilot performs servicing tasks** *SEA TECHNOLOGY*
  Plotnik, A. M., Rock, S. M.
  2007; 48 (4): 50-54
- **An operational real-time large-scale visual mosaicking and navigation system - Precision benthic positioning and mapping without transponders** *SEA TECHNOLOGY*
  Richmond, K., Rock, S.
  2007; 48 (3): 10-13
- **Improved estimation of target velocity using multiple model estimation and a dynamic Bayesian network for a robotic tracker of ocean animals** *12th International Symposium on Robotics Research (ISRR)*
  Plotnik, A., Rock, S.
  SPRINGER-VERLAG BERLIN.2007: 402–415
- **Real-Time Visual Mosaicking and Navigation of the USS Macon**
  Richmond, K., Rock, S., M.
  2007
- **Design and validation of a robotic control law for observation of deep-ocean jellyfish** *IEEE TRANSACTIONS ON ROBOTICS*
  Rife, J. H., Rock, S. M.
  2006; 22 (2): 282-291
- **Visual servoing of an ROV for servicing of tethered ocean moorings** *Oceans 2006 Conference*

Plotnik, A. M., Rock, S. M.
IEEE.2006: 1451–1456

- **Stochastic Feedback Controller Design Considering the Dual Effect**
  Kim, J., Rock, S., M.
  2006
- **An operational real-time large-scale visual mosaicking and navigation system** *Oceans 2006 Conference*
  Richmond, K., Rock, S. M.
  IEEE.2006: 1245–1250
- **Free-climbing with a multi-use robot** *9th International Symposium on Experimental Robotics (ISER)*
  Bretl, T., Rock, S., Latombe, J. C., Kennedy, B., Aghazarian, H.
  SPRINGER-VERLAG BERLIN.2006: 449–458
- **Toward autonomous free-climbing robots** *11th International Symposium on Robotics Research*
  Bretl, T., Latombe, J. C., Rock, S.
  SPRINGER-VERLAG BERLIN.2005: 6–15
- **Relative Position Sensing and Automatic Control for Observation in the Midwater by an Underwater Vehicle**
  Plotnik, A., M., Rock, S., M.
  2005
- **Multi-step motion planning for free-climbing robots** *6th International Workshop on Algorithmic Foundations of Robotics*
  Bretl, T., Lall, S., Latombe, J. C., Rock, S.
  SPRINGER-VERLAG BERLIN.2005: 59–74
- **A Multi-Sensor Approach to Automatic Tracking of Midwater Targets by an ROV**
  Plotnik, A., M., Rock, S., M.
  2005
- **Relative Position Sensing and Automatic Control for Observation in the Midwater by an Underwater Vehicle**
  Plotnik, A., M., Rock, S., M.
  2005
- **Multi-step motion planning for free-climbing robots** *6th International Workshop on Algorithmic Foundations of Robotics*
  Bretl, T., Lall, S., Latombe, J. C., Rock, S.
  SPRINGER-VERLAG BERLIN.2005: 59–74
- **Autonomous Deployment of a Self-Calibrating Pseudolite Array for Mars Rover Navigation**
  Matsuoka, M., Rock, S., M., Bualat, M., G.
  2004
- **Autonomous deployment of a self-calibrating pseudolite array for Mars rover navigation** *IEEE Position Location and Navigation Symposium*
  Matsuoka, M., Rock, S. M., Bualat, M. G.
  IEEE.2004: 733–739
- **Segmentation methods for visual tracking of deep-ocean jellyfish using a conventional camera** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Rife, J., Rock, S. M.
  2003; 28 (4): 595-608
- **Mars navigation system utilizes GPS** *IEEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE*
  LeMaster, E. A., Matsuoka, M., Rock, S. M.
  2003; 18 (4): 3-8
- **A local-area GPS pseudolite-based navigation system for Mars rovers** *10th International Conference on Advanced Robotics*
  LeMaster, E. A., Rock, S. M.
  SPRINGER.2003: 209–24

- **Motion planning for a three-limbed climbing robot in vertical natural terrain** *20th IEEE International Conference on Robotics and Automation (ICRA)*
  Bretl, T., Rock, S., Latombe, J. C.
  IEEE.2003: 2946–2953
- **An integrated system for command and control of cooperative robotic systems** *11th International Conference on Advanced Robotics (ICAR 2003)*
  Clark, C. M., Frew, E. W., Jones, H. L., Rock, S. M.
  UNIV COIMBRA, FAC CIENCIAS & TECHNOL.2003: 459–464
- **Trajectory generation for constant velocity target motion estimation using monocular vision** *20th IEEE International Conference on Robotics and Automation (ICRA)*
  Frew, E. W., Rock, S. M.
  IEEE.2003: 3479–3484
- **Relative position sensing by fusing monocular vision and inertial rate sensors** *11th International Conference on Advanced Robotics (ICAR 2003)*
  Huster, A., Rock, S. M.
  UNIV COIMBRA, FAC CIENCIAS & TECHNOL.2003: 1562–1567
- **Motion planning for multiple mobile robots using dynamic networks** *20th IEEE International Conference on Robotics and Automation (ICRA)*
  Clark, C. M., Rock, S. M., Latombe, J. C.
  IEEE.2003: 4222–4227
- **Improving Performance of a Jelly-Tracking Underwater Vehicle Using Recognition of Animal Motion Modes**
  Plotnik, A., M., Rock, S., M.
  2003
- **Dynamic Robot Networks for Motion Planning in Multi-Robot Space Systems**
  Clark, C., M., Rock, S., M., Latombe, J., C.
  2003
- **An Integrated System for Command and Control of Cooperative Robotic Systems**
  Clark, C., M., Frew, E., W., Jones, H., L., Rock, S., M.
  2003
- **Relative Position Sensing by Fusing Monocular Vision and Inertial Rate Sensors**
  Huster, A., Rock, S., M.
  2003
- **Trajectory Generation for Monocular-Vision Based Tracking of a Constant-Velocity Target**
  Frew, E., W., Rock, S., M.
  2003
- **Climbing Robots in Natural Terrain**
  Bretl, T., Miller, T., Rock, S., M., Latombe, J., C.
  2003
- **Automatic Determination of Vision Lock on the Seafloor in the Presence of Dust**
  Richmond, K., Black-Schaffer, D., Rock, S., M.
  2003
- **Motion Planning for Multiple Mobile Robots using Dynamic Networks**
  Clark, C., M., Rock, S., M., Latombe, J., C.
  2003
- **Gradient-based parameter optimization for systems containing discrete-valued functions** *INTERNATIONAL JOURNAL OF ROBUST AND NONLINEAR CONTROL*
  Wilson, E., Rock, S. M.
  2002; 12 (11): 1009-1028

- **Randomized kinodynamic motion planning with moving obstacles** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
  Hsu, D., Kindel, R., Latombe, J. C., Rock, S.
  2002; 21 (3): 233-255
- **Dialogue-based human-robot interaction for space construction teams** *IEEE Aerospace Conference*
  Jones, H., Rock, S.
  IEEE.2002: 3645–3653
- **Field experiments in the control of a jellyfish tracking ROV** *MTS/IEEE Oceans 2002 Conference*
  Rife, J., Rock, S. M.
  IEEE.2002: 2031–2038
- **Applying kinodynamic randomized motion planning with a dynamic priority system to multi-robot space systems** *IEEE Aerospace Conference*
  Clark, C. M., Bretl, T., Rock, S.
  IEEE.2002: 3621–3631
- **Relative position estimation for AUVs by fusing bearing and inertial rate sensor measurements** *MTS/IEEE Oceans 2002 Conference*
  Huster, A., Frew, E. W., Rock, S. M.
  IEEE.2002: 1863–1870
- **Kinematic path-planning for formations of mobile robots with a nonholonomic constraint** *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2002)*
  Barfoot, T. D., Clark, C. M., Rock, S. M., D'Eleuterio, G. M.
  IEEE.2002: 2819–2824
- **Field demonstration of a mars navigation system utilizing GPS pseudolite transceivers** *IEEE Position Location and Navigation Symposium*
  LeMaster, E. A., Matsuoka, M., Rock, S. M.
  IEEE.2002: 150–155
- **Exploratory motion generation for monocular vision-based target localization** *IEEE Aerospace Conference*
  Frew, E. W., Rock, S.
  IEEE.2002: 3633–3643
- **Applying Kinodynamic Randomized Motion Planning with a Dynamic Priority System to Multi-Robot Space Systems**
  Clark, C., M., Bretl, T., Rock, S., M.
  2002
- **Kinematic Path-planning for Formations of Mobile Robots with a Nonholonomic Constraint**
  Barfoot, T., D., Clark, C., M., Rock, S., M., D'Eleuterio, G., M. T.
  2002
- **Field Demonstration of a Mars Navigation System Utilizing GPS Pseudolite Transceivers**
  LeMaster, E., A., Matsuoka, M., Rock, S., M.
  2002
- **Planning Robust Dynamic Transitions for Enhanced Mobility of Planetary Rovers**
  Bretl, T., C., Rock, S., M.
  2002
- **An Improved Solution Algorithm for Self-Calibrating Pseudolite Arrays**
  LeMaster, E., A., Rock, S., M.
  2002
- **Robust Execution of Aggressive Maneuvers for Planetary Robotics**
  Bretl, T., C., Rock, S., M.
  2002
- **Exploratory Motion Generation for Monocular Vision-Based Target Localization**
  Frew, E., W., Rock, S., M.

2002

- **3-D Capabilities for GPS Transceiver Arrays**
  Matsuoka, M., LeMaster, E., A., Rock, S., M.
  2002
- **Field Experiments in the Control of a Jellyfish Tracking ROV**
  Rife, J., Rock, S., M.
  2002
- **Autonomous Robots in SWAT Applications: Research, Design, and Operations Challenges**
  Jones, H., L., Rock, S., M., Burns, D., Morris, S.
  2002
- **Relative Position Estimation for AUVs by Fusing Bearing and Inertial Rate Sensor Measurements**
  Huster, A., Frew, E., W., Rock, S., M.
  2002
- **Quantification of cyclic motion of marine animals from computer vision** *MTS/IEEE Oceans 2002 Conference*
  Plotnik, A. M., Rock, S. M.
  IEEE.2002: 1575–1581
- **Nonlinear flight control using forebody tangential blowing** *JOURNAL OF GUIDANCE CONTROL AND DYNAMICS*
  Takahara, Y., Rock, S. M.
  2001; 24 (6): 1157-1166
- **Randomized kinodynamic motion planning with moving obstacles** *4th International Workshop on the Algorithmic Foundations of Robotics (WAFR)*
  Hsu, D., Kindel, R., Latombe, J. C., Rock, S.
  A K PETERS, LTD.2001: 247–264
- **A Local-Area GPS Pseudolite-Based Mars Navigation System**
  LeMaster, E., A., Rock, S., M.
  2001
- **A Pilot-Aid for ROV Based Tracking of Gelatinous Animals in the Midwater**
  Rife, J., Rock, S., M.
  2001
- **Visual Tracking of Jellyfish In Situ**
  Rife, J., Rock, S., M.
  2001
- **Relative Position Estimation for Intervention-Capable AUVs by Fusing Vision and Inertial Measurements**
  Huster, A., Rock, S., M.
  2001
- **Randomized Motion Planning for Groups of Nonholonomic Robots**
  Clark, C., M., Rock, S., M.
  2001
- **Relative Position Estimation for Manipulation Tasks by Fusing Vision and Inertial Measurements**
  Huster, A., Rock, S., M.
  2001
- **Visual Tracking of Jellyfish In Situ**
  Rife, J., Rock, S., M.
  2001
- **Relative Position Estimation for Intervention-Capable AUVs by Fusing Vision and Inertial Measurements**
  Huster, A., Rock, S., M.

2001

- **Randomized Motion Planning for Groups of Nonholonomic Robots**
  Clark, C., M., Rock, S., M.
  2001
- **Relative Position Estimation for Manipulation Tasks by Fusing Vision and Inertial Measurements**
  Huster, A., Rock, S., M.
  2001
- **Kinodynamic Motion Planning Amidst Moving Obstacles**
  Kindel, R., Hsu, D., Latombe, J., C., Rock, S., M.
  2000
- **Field Test Results for a Self-Calibrating Pseudolite Array**
  LeMaster, E., A., Rock, S., M.
  2000
- **Aileron effectiveness at high angles of attack: Interaction with forebody blowing** *AIAA Atmospheric Flight Mechanics Conference*
  Pedreiro, N., Takahara, Y., Rock, S. M.
  AMER INST AERONAUT ASTRONAUT.1999: 981–86
- **GPS Pseudolite Transceivers and their Applications**
  Stone, J., M., LeMaster, E., A., Powell, D., J., Rock, S., M.
  1999
- **Self-Calibration of Pseudolite Arrays Using Self-Differencing Transceivers**
  LeMaster, E., A., Rock, S., M.
  1999
- **Cooperative research in underwater robot mission-level programming methodologies** *INTERNATIONAL JOURNAL OF SYSTEMS SCIENCE*
  Coste-Maniere, E., Wang, H. H., Rock, S. M., Rigaud, V., Peuch, A., Perrier, M.
  1998; 29 (10): 1099-1110
- **Development and experimental validation of an underwater manipulator hydrodynamic model** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
  McLain, T. W., Rock, S. M.
  1998; 17 (7): 748-759
- **Roll-yaw control at high angle of attack by forebody tangential blowing** *JOURNAL OF AIRCRAFT*
  Pedreiro, N., Rock, S. M., Celik, Z. Z., Roberts, L.
  1998; 35 (1): 69-77
- **Human-robot interaction for field operation of an autonomous helicopter** *Conference on Mobile Robots XIII and Intelligent Transportation Systems*
  Jones, H. L., Frew, E. W., Woodley, B. R., Rock, S. M.
  SPIE-INT SOC OPTICAL ENGINEERING.1998: 244–251
- **Combined CDGPS and vision-based control of a small autonomous helicopter** *American Control Conference*
  Rock, S. M., Frew, E. W., Jones, H., LeMaster, E. A., Woodley, B. R.
  IEEE.1998: 694–698
- **Human-Robot Interaction for Field Operation of an Autonomous Helicopter** *Mobile Robots XIII and Intelligent Transportation Systems*
  Jones, H., L., Frew, E., W., Woodley, B., R., Rock, S., M.
  1998; 3525: 244-252
- **Combined CDGPS and Vision-Based Control of a Small Autonomous Helicopter**
  Rock, S., M., Frew, E., Jones, H., Woodley, B., R., LeMaster, E., A.
  1998
- **Model Development of an Underwater Manipulator for Coordinated Arm-Vehicle Control**

Leabourne, K., N., Rock, S., M.
1998

- **Experimental Validation of a Real-Time Vision Sensor and Navigation System for Intelligent Underwater Vehicles**
  Fleischer, S., D., Rock, S., M.
  1998
- **Demonstration of a Vision-Based Dead-Reckoning System for Navigation of an Underwater Vehicle**
  Huster, A., Fleischer, S., D., Rock, S., M.
  1998
- **A Contestant in the 1997 International Aerial Robotics Competition**
  Woodley, B., R., Jones, H., Frew, E., LeMaster, E., A., Rock, S., M.
  1997
- **Global position determination and vehicle path estimation from a vision sensor for real-time video Mosaicking and navigation** *Oceans 97 MTS/IEEE Conference*
  Fleischer, S. D., Rock, S. M., Burton, R.
  IEEE.1997: 641–647
- **Station keeping of an ROV using vision technology** *Oceans 97 MTS/IEEE Conference*
  Leabourne, K. N., Rock, S. M., Fleischer, S. D., Burton, R.
  IEEE.1997: 634–640
- **Station Keeping of an ROV Using Vision Technology**
  Leabourne, K., N., Rock, S., M., Fleischer, S., D., Burton, R., L.
  1997
- **Global Position Determination and Vehicle Path Estimation from a Vision Sensor for Real-Time Video Mosaicking and Navigation**
  Fleischer, S., D., Rock, S., M., Burton, R., L.
  1997
- **Frequency-weighted state estimation with application to estimation in the presence of sensor bias** *IEEE TRANSACTIONS ON CONTROL SYSTEMS TECHNOLOGY*
  ALDER, L. J., Rock, S. M.
  1996; 4 (4): 427-436
- **OTTER: The design and development of an intelligent underwater robot** *1995 IEEE International Conference on Robotics and Automation - Autonomous Underwater Robots*
  Wang, H. H., Rock, S. M., Lee, M. J.
  KLUWER ACADEMIC PUBL.1996: 297–320
- **Experiments in the hydrodynamic modeling of an underwater manipulator** *1996 Symposium on Autonomous Underwater Vehicle Technology (AUV 96)*
  McLain, T. W., Rock, S. M.
  I E E E.1996: 463–469
- **Video mosaicking along arbitrary vehicle paths** *1996 Symposium on Autonomous Underwater Vehicle Technology (AUV 96)*
  Fleischer, S. D., Wang, H. H., Rock, S. M., Lee, M. J.
  I E E E.1996: 293–299
- **Carrier Phase GPS and Computer Vision for the Control of an Autonomous Helicopter**
  Woodley, B., R., Jones, H., L., LeMaster, E., A., Frew, E., W., Rock, S., M.
  1996
- **Real-time Dynamic Trajectory Optimization**
  Miles, D., W., Rock, S., M.
  1996
- **A Contestant in the 1996 International Aerial Robotics Competition**
  Woodley, B., R., Jones, H., Frew, E., LeMaster, E., A., Rock, S., M.

1996

- **Experiments in the Hydrodynamic Modeling of an Underwater Manipulator**
  McLain, T., W., Rock, S., M.
  1996

- **Video Mosaicking Along Arbitrary Vehicle Paths**
  Fleischer, S., D., Wang, H., H., Rock, S., M., Lee, M., J.
  1996

- **Joint evaluation of mission programming for underwater robots** *IEEE International Conference on Robotics and Automation*
  COSTEMANIERE, E., Peuch, A., Perrier, M., Rigaud, V., Wang, H. H., Rock, S. M., Lee, M. J.
  IEEE.1996: 2492–2497

- **Experiments in the coordinated control of an underwater arm/vehicle system** *1995 IEEE International Conference on Robotics and Automation - Autonomous Underwater Robots*
  McLain, T. W., Rock, S. M., Lee, M. J.
  KLUWER ACADEMIC PUBL.1996: 213–32

- **TOWARD AN IMPROVED UNDERSTANDING OF THRUSTER DYNAMICS FOR UNDERWATER VEHICLES** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Healey, A. J., Rock, S. M., Cody, S., Miles, D., Brown, J. P.
  1995; 20 (4): 354-361

- **NEURAL-NETWORK CONTROL OF A FREE-FLYING SPACE ROBOT** *SIMULATION*
  Wilson, E., Rock, S. M.
  1995; 65 (2): 103-115

- **REAL-TIME VIDEO MOSAICKING OF THE OCEAN-FLOOR** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  MARKS, R. L., Rock, S. M., Lee, M. J.
  1995; 20 (3): 229-241

- **INTEGRATED FLIGHT PROPULSION CONTROL - SUBSYSTEM SPECIFICATIONS FOR PERFORMANCE** *JOURNAL OF GUIDANCE CONTROL AND DYNAMICS*
  NEIGHBORS, W. K., Rock, S. M.
  1995; 18 (3): 572-578

- **Real-time video mosaicking of the ocean floor** *IEEE Journal of Oceanic Engineering*
  Marks, R., L., Rock, S., M., Lee, M., J.
  1995; 20 (3): 229-241

- **A Contestant in the 1995 International Aerial Robotics Competition**
  Woodley, B., R., Jennings, C., Conway, A., Rock, S., M.
  1995

- **Coupled-System Stability of Flexible-Object Impedance Control**
  Meer, D., W., Rock, S., M.
  1995

- **Improved Real-Time Video Mosaicking of the Ocean Floor**
  Fleischer, S., D., Marks, R., L., Rock, S., M., Lee, M., J.
  1995

- **Neural Network Control of a Free-Flying Space Robot** *Simulation*
  Wilson, E., Rock, S., M.
  1995; 65 (2): 103-115

- **Experiments in the coordination of Underwater Manipulator and Vehicle Control**
  McLain, T., W., Rock, S., M., Lee, M., J.
  1995

- **Underwater Vehicle Control from a Virtual Environment Interface**
  Fleischer, S., D., Rock, S., M., Lee, M., J.
  1995
- **Experiments in the Automatic Retrieval of Underwater Objects with an AUV**
  Wang, H., H., Rock, S., M., Lee, M., J.
  1995
- **Reconfigurable Control of a Free-Flying Space Robot using Neural Networks**
  Wilson, E., Rock, S., M.
  1995
- **OTTER: A Testbed Submersible for Robotics Research**
  Wang, H., H., Marks, R., L., McLain, T., W., Fleischer, S., D., Miles, D., W., Sapilewski, G., A., Rock, S. M.
  1995
- **An Operational Space Formulation for a Free-Flying, Multi-Arm Space Robot**
  Russakow, J., Rock, S., M., Khatib, O.
  1995
- **Experiments in the Automatic Retrieval of Underwater Objects with an AUV**
  Wang, H., H., Rock, S., M., Lee, M., J.
  1995
- **Reconfigurable Control of a Free-Flying Space Robot using Neural Networks**
  Wilson, E., Rock, S., M.
  1995
- **OTTER: A Testbed Submersible for Robotics Research**
  Wang, H., H., Marks, R., L., McLain, T., W., Fleischer, S., D., Miles, D., W., Sapilewski, G., A., Rock, S. M.
  1995
- **An Operational Space Formulation for a Free-Flying, Multi-Arm Space Robot**
  Russakow, J., Rock, S., M., Khatib, O.
  1995
- **EXPERIMENTS IN CONTROL OF A FLEXIBLE-LINK ROBOTIC MANIPULATOR WITH UNKNOWN PAYLOAD DYNAMICS - AN ADAPTIVE APPROACH** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
  ALDER, L. J., Rock, S. M.
  1994; 13 (6): 481-495
- **INTEGRATED FLIGHT/PROPULSION CONTROL FOR HELICOPTERS** *JOURNAL OF THE AMERICAN HELICOPTER SOCIETY*
  Rock, S. M., Neighbors, K.
  1994; 39 (3): 34-42
- **ACTIVE CONTROL OF WING ROCK USING TANGENTIAL LEADING-EDGE BLOWING** *AIAA 31st Aerospace Sciences Meeting*
  Wong, G. S., Rock, S. M., Wood, N. J., Roberts, L.
  AMER INST AERONAUT ASTRONAUT.1994: 659–65
- **INTEGRATED FLIGHT/PROPULSION CONTROL - SUBSYSTEM SPECIFICATIONS** *JOURNAL OF GUIDANCE CONTROL AND DYNAMICS*
  Rock, S. M., EMAMINAEINI, A., Neighbors, K.
  1994; 17 (1): 201-208
- **NEURAL-NETWORK CONTROL OF A FREE-FLYING SPACE ROBOT** *1994 International-Neural-Network-Society Annual Meeting - World Congress on Neural Networks-San Diego*
  Wilson, E., Rock, S. M.
  LAWRENCE ERLBAUM ASSOC PUBL.1994: B15–B22
- **AUTOMATIC VISUAL STATION KEEPING OF AN UNDERWATER ROBOT** *Oceans 94/OSATES Conference on Oceans Engineering for Today's Technology and Tomorrow's Preservation*

MARKS, R. L., Wang, H. H., Lee, M. J., Rock, S. M.
IEEE.1994: B137–B142

- **Toward an improved understanding of thruster dynamics for underwater vehicles** *1994 Symposium on Autonomous Underwater Vehicle Technology (AUV 94)*
  Healey, A. J., Rock, S. M., Cody, S., Miles, D., Brown, J. P.
  IEEE.1994: 340–352
- **Real-time video mosaicking of the ocean floor** *1994 Symposium on Autonomous Underwater Vehicle Technology (AUV 94)*
  MARKS, R. L., Rock, S. M., Lee, M. J.
  IEEE.1994: 21–27
- **Visual Sensing for Control of an Underwater Robotic Vehicle**
  Marks, R., L., Lee, M., J., Rock, S., M.
  1994
- **Real-Time Video Mosaicking of the Ocean Floor**
  Marks, R., L., Rock, S., M., Lee, M., J.
  1994
- **Object-Based Task-Level Control: A Hierarchical Control Architecture for Remote Operation of Space Robots**
  Stevens, H., D., Miles, E., S., Rock, S., M., Cannon, R., H.
  1994
- **Experiments in Object Impedance Control for Flexible Objects**
  Meer, D., W., Rock, S., M.
  1994
- **Experiments in Control of a Flexible-Link Robotic Manipulator with Unknown Payload Dynamics: An Adaptive Approach** *International Journal of Robotics Research*
  Alder, L., J., Rock, S., M.
  1994; 13 (6): 481-495
- **Automatic Visual Station Keeping of an Underwater Robot**
  Marks, R., L., Wang, H., H., Lee, M., J., Rock, S., M.
  1994
- **Neural network control of a free-flying space robot**
  Wilson, E., Rock, S., M.
  1994
- **Toward an improved understanding of thruster dynamics for underwater vehicles**
  Healey, A., J., Rock, S., M., Cody, S., Miles, D., Brown, J., P.
  1994
- **Generalized Object Control and Assembly for Space Robots**
  Russakow, J., Rock, S., M.
  1994
- **Experiments in Control of a Free-Flying Space Robot using Fully-Connected Neural Networks**
  Wilson, E., Rock, S., M.
  1993
- **EXPERIMENTS IN CONTROL OF A FREE-FLYING SPACE ROBOT USING FULLY-CONNECTED NEURAL NETWORKS** *World Congress on Neural Networks (WCNN 93, Portland)*
  Wilson, E., Rock, S. M.
  LAWRENCE ERLBAUM ASSOC PUBL.1993: 157–162
- **ADAPTIVE-CONTROL OF A FLEXIBLE-LINK ROBOTIC MANIPULATOR WITH UNKNOWN PAYLOAD DYNAMICS** *1993 AMERICAN CONTROL CONF*
  ALDER, L. J., Rock, S. M.

I E E E.1993: 2088–2092

- **AUTOMATIC OBJECT TRACKING FOR AN UNMANNED UNDERWATER VEHICLE USING REAL-TIME IMAGE FILTERING AND CORRELATION** *1993 IEEE International Conference on Systems, Man and Cybernetics*
  MARKS, R. L., Rock, S. M., Lee, M. J.
  I E E E.1993: 337–342
- **Adaptive Control of a Flexible-Link Robotic Manipulator with Unknown Payload Dynamics**
  Alder, L., J., Rock, S., M.
  1993
- **Task-Based Control Architecture for an Untethered, Unmanned Submersible**
  Wang, H., H., Marks, R., L., Rock, S., M., Lee, M., J.
  1993
- **Object Control for Undersea Robotic Vehicles** *Stanford University Aerospace Robotics Lab*
  Cannon, R., H., Rock, S., M., Marks, R., L., McLain, T., W., Miles, D., W., Wang, H., H.
  1993
- **A Modular System Architecture for Multi-Manipulator, Free-Flying Space Robots**
  Ullman, M., A., Cannon, R., H., Rock, S., M.
  1993
- **Optimal Control of a Two-Link Flexible Manipulator Using Time-Varying Controller Gains: Initial Experiments**
  Ballhaus, W., L., Rock, S., M., E. Jr., B., A.
  1992
- **EXPERIMENTAL-MEASUREMENT OF ROV TETHER TENSION** *INTERVENTION / ROV 92 CONF AND EXPOSITION : A DECADE OF ACHIEVEMENTS*
  McLain, T. W., Rock, S. M.
  MARINE TECHNOLOGY SOC.1992: 291–296
- **Cooperative Manipulation of Flexible Objects: Initial Experiments**
  Meer, D., W., Rock, S., M.
  1992
- **End-Point Control of a Two-Link Flexible Robotic Manipulator with a Mini-Manipulator: Dynamic Coupling Issues**
  Ballhaus, W., L., Rock, S., M.
  1992
- **Experimental Measurement of ROV Tether Tension**
  McLain, T., W., Rock, S., M.
  1992
- **End-Point Control of a Two-Link Flexible Robotic Manipulator with a Mini-Manipulator: Initial Experiments**
  Ballhaus, W., L., Rock, S., M.
  1992
- **Combined Camera and Vehicle Tracking of Underwater Objects**
  Wang, H., H., Marks, R., L., Rock, S., M., Lee, M., J., Burton, R., C.
  1992
- **Control of a Flexible Robotic Manipulator with Unknown Payload Dynamics: Initial Experiments**
  Alder, L., J., Rock, S., M.
  1991
- **EFFECT OF MODEL UNCERTAINTY ON FAILURE-DETECTION - THE THRESHOLD SELECTOR** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*
  EMAMINAEINI, A., AKHTER, M. M., Rock, S. M.
  1988; 33 (12): 1106-1115