An Excellent Addition to Your Library!

Released: November 2011

Internet Accessible Remote Laboratories: Scalable E-Learning Tools for Engineering and Science Disciplines

Abul K.M. Azad (Northern Illinois University, USA), Michael E. Auer (Carinthia University of Applied Sciences, Austria) and V. Judson Harward (Massachusetts Institute of Technology, USA)

Limited resources and other factors pose major challenges for engineering, technology, and science educators’ ability to provide adequate laboratory experience for students. An Internet accessible remote laboratory, which is an arrangement that allows laboratory equipment to be controlled remotely, addresses these difficulties and allows more efficient laboratory management.

Internet Accessible Remote Laboratories: Scalable E-Learning Tools for Engineering and Science Disciplines collects current developments in the multidisciplinary creation of Internet accessible remote laboratories. This book offers perspectives on teaching with online laboratories, pedagogical design, system architectures for remote laboratories, future trends, and policy issues in the use of remote laboratories. It is useful resource for graduate and undergraduate students in electrical and computer engineering and computer science programs, as well as researchers who are interested in learning more about the current status of the field, as well as various approaches to remote laboratory design.

Topics Covered:
- Collaborative Research on Remote Laboratories
- Educational Tools for Remote Laboratories
- Industrial Applications of Remote Laboratories
- Inter-Institutional Use of Remote Laboratories
- Pedagogical Design of Remote Laboratories
- Remote Laboratories and Ethical Concerns
- Sustainability of Remote Laboratories
- System Architectures for Remote Laboratories
- System Design, Hardware and Interfacing
- Teaching with Remote Laboratories

Market: This premier publication is essential for all academic and research library reference collections. It is a crucial tool for academicians, researchers, and practitioners and is ideal for classroom use.

Abul K. M. Azad is a Professor with the Technology Department of Northern Illinois University. He has a Ph.D. in Control and Systems Engineering and M.Sc. and B.Sc. in Electronics Engineering. He has been in academics for 15+ years, and his research interests include remote laboratories, mechatronic systems, adaptive/intelligent control, mobile robotics, and educational research. In these areas, Dr. Azad has over 100 refereed journal and conference papers, edited books, and book chapters. So far, he has attracted around $1.5M of research and development grants from various national and international funding agencies. He is a member of the editorial board for a number of professional journals as well as the Associate Editor-in-Chief of the International Journal of Online Engineering. He is active with various professional organizations and has served as Chair and Co-Chairs of numerous conferences and workshops, in addition to serving on the program committees of around 30 international conferences. He is a senior member of IEEE and ISA and a member of ASEE, IET, and CLAWAR.

Publishing Academic Excellence at the Pace of Technology Since 1988
Section 1: Teaching with Remote Laboratories: Case Studies

Chapter 1
*A LabVIEW-based Remote Laboratory*
You Yuqiu (Morehead State University, USA)

Chapter 2
*Teaching Hardware Design with Online Laboratories*
Hashemian Reza (Northern Illinois University, USA)
Pearson Timothy R. (Northern Illinois University, USA)

Chapter 3
*New Tools in Hardware and Software Design Applied for Remote Photovoltaic Laboratory*
Costas Petru A. (Transylvania University of Brasov, Romania)
Costas Daniel T. (Transylvania University of Brasov, Romania)
Ursuăti Doru (Transylvania University of Brasov, Romania)
Samoila Cornel (Transylvania University of Brasov, Romania)
Iordache Dragoş (Transylvania University of Brasov, Romania)

Chapter 4
*Remote Experiments in Freshman Engineering Education by Integrated e-Learning*
Očivoldová Miroslava (University of Trnava, Slovak Republic & Tomas Bata University in Zlín, Czech Republic)
Schauer Franz (University of Trnava, Slovak Republic & Tomas Bata University in Zlín, Czech Republic)

Chapter 5
*Implementation of Remote Laboratories for Industrial Education*
Rojko Andreja (University of Maribor, Slovenia)
Zücher Thomas (Biel Academy of Applied Science, Switzerland)
Hergoz Darlko (University of Maribor, Slovenia)
Stebler Renato (Biel Academy of Applied Science, Switzerland)

Chapter 6
*Collaborative Development and Utilization of Labs in East Africa*
Mkwirize Cosmas (Makerere University, Uganda)
Tumusiime Arthur Asiimwe (Makerere University, Uganda)
Mmasazi Paul Isaac (Makerere University, Uganda)
Tinkodri-Togboa Sandy Stevens (Makerere University, Uganda)
Jiwaju Adnaan (University of Dar es Salaam, Tanzania)
Nomba Josiah (University of Dar es Salaam, Tanzania)
Maiseli Baraka (University of Dar es Salaam, Tanzania)
Sapula Teyana (University of Dar es Salaam, Tanzania)
Muambela Alfred (University of Dar es Salaam, Tanzania)

Section 2: Teaching with Remote Laboratories: Best Practices and Pedagogy

Chapter 7
*Online Laboratory Education:*
Albon Simon P. (University of British Columbia, Canada)
Cancilla Devon A. (Western Washington University, USA)

Chapter 8
*The Role of Internet-Accessible Laboratory Plants in the Teaching of Automatic Control*
Aravoskić Kure Maja (University of Ljubljana, Slovenia)
Karba Rihard (University of Ljubljana, Slovenia)
Logar Vito (University of Ljubljana, Slovenia)

Chapter 9
*Evaluation of Remote Interface Component alternatives for Teaching Tele-Robotic Operation*
Olive Goldstein (Tel-Aviv University, Israel)
Irad Ben-Gal (Tel-Aviv University, Israel)
Yossi Bokchein (Tel-Aviv University, Israel)

Chapter 10
*Teaching Technology Computer Aided Design (TCAD) Online*
Maiti Chinmay K. (Indian Institute of Technology, India)
Maiti Ananda (Indian Institute of Technology, India)

Chapter 11
*AutomatedL@bs Consortium:*
Dormido Sebastián (Universidad Nacional de Educación a Distancia, Spain)
Vargas Héctor (Pontificia Universidad Católica de Valparaíso, Chile)
Sánchez José (Universidad Nacional de Educación a Distancia, Spain)

Section 3: System Architecture, Design, and Interfaces

Chapter 12
*On Infrastructures for Educational Online Laboratories*
Esche Sven K. (Stevens Institute of Technology, USA)
Chassapis Constantini (Stevens Institute of Technology, USA)

Chapter 13
*Architecture and Design Methodologies for Scalable and Sustainable Remote Laboratory Infrastructures*
Thames J. Lane (Georgia Institute of Technology, USA)
Ahler Randal (Georgia Institute of Technology, USA)
Hyder Andrew (Georgia Institute of Technology, USA)
Wellman Robert (Georgia Institute of Technology, USA)
Schaefer Dirk (Georgia Institute of Technology, USA)

Chapter 14
*A Lab Server Model for the iLab Shared Architecture*
Buschtaia Paolo (University of Genoa, Italy)
Niedersäcker Michael (Carinthia University of Applied Sciences, Austria)
Scoppola Anna Marina (University of Genoa, Italy)

Chapter 15
*The VISIR Open Lab Platform*
Gustavsson Inge (Blekinge Institute of Technology, Sweden)
Claesson Lena (Blekinge Institute of Technology, Sweden)
Nilsson Kristian (Blekinge Institute of Technology, Sweden)
Zackrissn Johan (Blekinge Institute of Technology, Sweden)
Zubia Javier Garcia (University of Deusto, Spain)
Jairo Unai Hernandez (University of Deusto, Spain)
Håkansson Lars (Blekinge Institute of Technology, Sweden)
Bartunek Josef Ström (Blekinge Institute of Technology, Sweden)
Lagō Thomas (TechFuzion, USA)
Claesson Inge (Blekinge Institute of Technology, Sweden)

Chapter 16
*Online Workbenches for the Deployment of Electronics Experiments*
Hardinson James L. (Massachusetts Institute of Technology, USA)
Zatin Danilo Garbi (Carinthia University of Applied Sciences, Austria)

Chapter 17
*Web-Enabled Remote Control Laboratory Using an Embedded Ethernet Microcontroller*
Dubey Chandresh (Polytechnic Institute of NYU, USA)
Wong Hong (Gedex Inc., Ontario, Canada)
Kapila Vikram (Polytechnic Institute of NYU, USA)
Kumar Parth (Polytechnic Institute of NYU, USA)

Chapter 18
*Matlab RTW-based Internet Accessible Remote Laboratory for Teaching Robot Control*
Kovačić Zdenko (University of Zagreb, Croatia)
Jerić Davor (University of Zagreb, Croatia)
Vojvoda Vedran (University of Zagreb, Croatia)
Matija Sinjarić (University of Zagreb, Croatia)

Chapter 19
*Remotely Accessible Systems for Computing Science Disciplines*
Stockman Mark (University of Cincinnati, USA)

Chapter 20
*Remote Instrumentation for Science Education:*
Lyde Fred E. (Purdue University, USA)
Weaver Gabriela C. (Purdue University, USA)
Wyss Phillip (Purdue University, USA)
Steffen Debora (Purdue University, USA)
Campbell John (Purdue University, USA)

Section 4: Policy Issues

Chapter 21
*What do Students Gain from Laboratory Experiences?*
Trevlyn James (The University of Western Australia, Australia)
Razali Zol Bahri (The University of Western Australia, Australia)
Chapter 22

Developing Remote Labs for Challenged Educational Environments
Kehinde Lawrence Olakunle (Texas Southern University, USA)
Chen Xuemin (Texas Southern University, USA)
Ayodele Kayode P. (Obafemi Awolowo University, Nigeria)
Akinwale Oluwale B. (Obafemi Awolowo University, Nigeria)

Chapter 23

Labshare
Lowen David (University of Technology, Sydney, Australia)
Conlon Stephen (University of Technology, Sydney, Australia)
Murray Steve (University of Technology, Sydney, Australia)
Weber Lohar (University of Technology, Sydney, Australia)
de la Villefromoy Michel (University of Technology, Sydney, Australia)
Lindsay Euan (Curtin University of Technology, Australia)
Nafalski Andrew (University of South Australia, Australia)
Nageswaran Warren (Royal Melbourne Institute of Technology, Australia)
Tang Tee (Queensland University of Technology, Australia)

Chapter 24

Collaborative Sustainability Strategies for Online Laboratories
Watson Roger (University of Cambridge, UK)
Coble Aaron (cmcl innovations, UK)
Bhave Amit (cmcl innovations, UK)
Braumann Andreas (University of Cambridge, UK)
Smallbone Andrew (cmcl innovations, UK)
Kraft Markus (University of Cambridge, UK & cmcl innovations, UK)

Section 5: Future Trends

Chapter 25

Possible Futures for Remote Laboratories
Schulz Mark F. (The University of Queensland, Australia)
Long Phillip (The University of Queensland, Australia)

Chapter 26

Mobile Laboratory Model for Next-Generation Heterogeneous Wireless Systems
Ngom Ibrahima (École Supérieure Polytechnique/UCAD, Sénégal)
Salah-Hassane Hamadou (Télé-université/UQAM, Canada)
Lishou Claude (École Supérieure Polytechnique/UCAD, Sénégal)

Chapter 27

Stakes and Issues for Collaborative Remote Laboratories in Virtual Environments
Fayolle Jacques (TELECOM Saint-Etienne, France)
Callaghan Michael (University of Ulster, Northern Ireland, UK)
Gravier Christopher (TELECOM Saint-Etienne, France)
Harkin Jim (University of Ulster, Northern Ireland, UK)
Jailly Benjamin (TELECOM Saint-Etienne, France)

Chapter 28

Towards an Immersive Virtual Environment for Physics Experiments Supporting Collaborative Settings in Higher Education
Gürt Christian (Graz University of Technology, Austria & Curtin University of Technology, Australia)
Schuecher Tina (Graz University of Technology, Austria & Massachusetts Institute of Technology, USA)
Baikey Philip H. (Massachusetts Institute of Technology, USA)
Belcher John (Massachusetts Institute of Technology, USA)
Ricardo dos Santos Fabio (Graz University of Technology, Austria & Massachusetts Institute of Technology, USA)
Berger Stefan (Graz University of Technology, Austria & Massachusetts Institute of Technology, USA)

Chapter 29

A Semantic Portal for Publication and Exchange of Educational Online Laboratories
Niederstätte Michael (Carinthia University of Applied Sciences, Austria)
Mayer Christian (Carinthia University of Applied Sciences, Austria)

Order Your Copy Today!

Name: ________________________________
Organization: ________________________________
Address: ________________________________
City, State, Zip: ________________________________
Country: ________________________________
Tel: ________________________________
Fax: ________________________________
E-mail: ________________________________

Enclosed is check payable to IGI Global in US Dollars, drawn on a US-based bank

Credit Card □ Mastercard □ Visa □ Am. Express

3 or 4 Digit Security Code: ________________________________
Name on Card: ________________________________
Account #: ________________________________
Expiration Date: ________________________________