

Roe Diamant
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EDUCATION

- PhD**, Electrical Engineering, University of British Columbia, 2009-2013
Thesis: “Spatial Reuse Scheduling and Localization for Underwater Acoustic Communication Networks”, Advisor: Prof. Lutz Lampe
Design and analysis of spatial reuse techniques to improve network throughput, delay, and robustness through scheduling. Machine learning approaches for localization and tracking. Exploiting channel effects in the wireless scheduler design
- Studies for Master of Arts**, Philosophy, Haifa University, Israel 2006-2008
- Master of Science**, Electrical Engineering, Technion, Israel, 2003-2007
Thesis: “Time Reversal MIMO Architecture for Very Shallow Underwater Acoustic Communication”, Advisor: Prof. Arie Feuer
Design of Multi Input Multi Output (MIMO) scheme combined with Time Reversal Modulation to exploit the time and spatial diversity characteristics of the Underwater Acoustic Channel. Development of adaptive equalizers to combat strong ISI and ASI
- Diploma**, Acoustics, Penn State University, USA 2006
- Bachelor of Science**, Electrical Engineering, Technion, Israel, 1998-2002
Final year project: “Machine Learning Approach for Detecting Objects in a Surveillance Camera”

PROFESSIONAL EXPERIENCE

- Research Fellow**, University of Haifa, School of Marine Science, 2013-present
Host: Dr. Izhak Makovski,
Signal Processing and Underwater Acoustic Navigation,
Performs independent research work on underwater networks and object detection
- Research Fellow**, Rafael Ltd., 2013-present
Host: Dr. Amos Dotan,
Radar Detection, Signal Processing, Machine Learning,
System Engineer and leads research and development teams
- Research Assistant**, Department of Electrical Engineering, UBC, 2009-present
Advisor: Prof. Lutz Lampe,
Developed scheduling, localization, and tracking for Underwater Acoustic Communication Networks,
Initiated the research on underwater acoustic communication at UBC, and formed collaboration with industry and three research institutes

PROFESSIONAL EXPERIENCE (continued)

Teaching Assistant , Department of Electrical Engineering, UBC, Taught the following undergraduate Engineering courses: “Circuit Laboratory”, “Introduction to C Programming”, “Project Integrated Program”	2011-present
Research Assistant , National University of Singapore, Advisors: Dr. Mandar Chitre, Dr. Wee Seng Soh <i>Derived a constraint EM algorithm for communication link classification</i>	2011
Research Assistant , Institute for Infocomm Research, Singapore, Advisor: Dr. Hwee Pink Tan <i>Developed a machine learning approach for dead-reckoning navigation at sea using only acceleration measurements</i>	2011
Project Manager , Rafael, Advanced Defence Systems, Israel, <i>Managed the research and production of a SONAR detection system,</i> Improved product performance, and dramatically increased profit by maximizing efficiency Work included: DSP card design (AI), hardware design of power amplifier, software development (ADA), mechanical design, testing and manufacturing (Managed a team of eight Engineers)	2007-2009
System Engineer , Rafael, Advanced Defence Systems, Israel, <i>Managed the development and production of a MIMO modem for fading channels in low SNR,</i> Developed from research to product, brought project to company Work included DSP card design (TI), hardware design of power amplifier, software development, mechanical design, heat dissipation, manufacturing (Managed a team of four Engineers)	2007-2009
Group Leader , Rafael, Advanced Defence Systems, Israel, <i>Designed modems for fading channels,</i> Work involved signal processing, channel coding, equalizers, detection and synchronization, theoretical analysis via information theory (Managed a group of three Engineers)	2002-2006
Algorithm Designer , Vespro, Israel, <i>Designed product for detection of cancer tissues through spectrum analysis</i>	2001-2002

ACADEMIC MENTORING

MSc. Co-Supervisor , Department of Electrical Engineering, UBC, “Correlation of Anchor Node Positions Using Ocean Current Models”	2012
BSc. supervisor , Department of Electrical Engineering, UBC, “Time-of-Arrival Estimation for Underwater Acoustic Localization”	2011
BSc. Supervisor , Department of Electrical Engineering, Technion, Israel: “A Spatial Diversity MAC Protocol for Ad-Hoc Networks”	2009
“A TDMA MAC Protocol for Ad-Hoc Underwater Acoustic Networks”	2008
“rake Receiver for Underwater Acoustic Communication”	2006
“Improved Emulation System for Underwater Acoustic Channel”	2005

SCHOLARSHIPS

- Vanier Canada Graduate Scholarship**, Government of Canada, 2010
“The Vanier Canada Graduate Scholarships (Vanier CGS) program attracts and retains world-class doctoral students to Canadian universities by supporting individuals who demonstrate strong leadership skills and a high standard of scholarly achievement in graduate studies in health, natural sciences, engineering, humanities and social sciences. This program provides 100 Canadian and international doctoral students with the highest prestigious scholarship in Canada valued at \$50,000 per year for three years.” (given annually to 100 students throughout Canada)
- Four Year Fellowship**, Electrical Engineering, University of British Columbia, 2009
“The Four Year Doctoral Fellowship (4YF) program ensures UBC’s best PhD students are provided with financial support of at least \$18,000 per year plus tuition for the first four years of their PhD studies. This program allows UBC to continue to attract and support outstanding domestic and international PhD students, and provide those students with stable, base-level funding for the first four years of their PhD studies and research.” (given annually to six students)
- Fullbright Scholarship**, Government of the USA, 2009
“The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to increase mutual understanding between the people of the United States and the people of other countries. Participants are chosen for their academic merit and leadership potential.” (given annually to 25 students from Israel)

LIST of MAJOR AWARDS

- The Lee Foundation Award**, National University of Singapore, 2012
“The Lee Foundation of Singapore, supports University of British Columbia students performing part of their research at the National University of Singapore. The amount of the award is valued at SGD \$2,500.” awarded annually to a single student from UBC
- Mobility Award**, Faculty of Graduate Studies, University of British Columbia, 2011
“The Mobility Award supports UBC graduate students who wish to participate in research abroad at a leading institution outside of North America. The award values \$1,500.” awarded annually to ten students
- Best Student Paper Competition**, IEEE Vancouver Section 2010
- First Place in the Three Minute Thesis Competition**, 2010
 Department of Electrical and Computer Engineering, University of British Columbia

LIST of MAJOR AWARDS (continued)

National Excellent Worker Competition, Israel Presidential Institute, 2009
“(translated from Hebrew) Israel excellent worker award is sponsored by the Israeli Presidential Institute and the national Labor Court. The award is given annually to 17 workers from all three working sectors in Israel, who are appreciated for their excellence and contribution to the working sector in Israel. Out of the winners, a single worker is chosen as Israel excellent worker and receives a stipend of 20,000 Shekels from the Israeli President.” awarded annually to a single worker

Intel Research Excellent Reward, Intel, Israel 2007
Awarded annually to 30 students from Israel

Additional list of Industry Leadership Awards available upon request

PROFESSIONAL AFFILIATIONS/ACTIVITIES

Conference Session Chair, Oceans (Fall-2014), VTC(Fall-2011)

TPC Member, IEEE Oceans (2014), IEEE ICWiSe (2014), I4CT' (2014), ADVKIT' (2014), ISTMET (2014), IEEE ISCI(2013), IEEE APACE(2012), IEEE ISWTA(2012), IEEE ICC(2011), IEEE AINA(2009)

(Journals) Reviewer, IEEE Journal of Selected Areas in Communication, IEEE Journal of Wireless Communication, IEEE Transactions on Communications, IEEE Journal of Oceanic Eng., IEEE Sensors, IEEE Transaction of Networking, IEEE Transaction of Wireless Communication, Elsevier Computer Communications, MDPI Sensors, MDPI Ad Hoc and Ubiquitous Computing, Wireless Communication and Mobile Computing

(Conference) Reviewer, IEEE ICC(2013), ACM WUWNet(2012) , ACM WUWNet(2011)

Member ,	
Marine Technology Society (MTS)	2013-present
Institute of Electrical and Electronics Engineers (IEEE)	2009-present
Association for Computing Machinery (ACM)	2012-present

PEER-REVIEWED PUBLICATIONS**Registered Patents**

Roe Diamant, “Quadratic Frequency Modulation in Sonar Systems,”
IL/2185 11 06 54, Filing Date 4/6/2007

Journal Articles (Published/Accepted)

1. Roe Diamant, Lars Michael Wolff and Lutz Lampe, "Location Tracking of Ocean Current Related Underwater Drifting Nodes Using Doppler Shift Measurements," *IEEE Journal of Oceanic Engineering*, 2014.
2. Roe Diamant and Lutz Lampe, "Adaptive Error-Correction Coding Scheme for Underwater Acoustic Communication Networks," *IEEE Journal of Oceanic Engineering*, 2014.
3. Roe Diamant and Yunye Jin, "A Machine Learning Approach for Dead-Reckoning Navigation at Sea Using a Single Accelerometer," *IEEE Journal of Oceanic Engineering*, 2013.
4. Roe Diamant, Ghasem Naddafzadeh Shiraz, and Lutz Lampe, "Robust Spatial Reuse Scheduling in Underwater Acoustic Communication Networks," *IEEE Journal of Oceanic Engineering*, Dec. 2012.
5. Roe Diamant, Hwee-Pink Tan, and Lutz Lampe, "LOS and NLOS Classification for Underwater Acoustic Localization," *IEEE Transactions of Mobile Computing*, Nov. 2012.
6. Roe Diamant, Wenbo Shi, Wee-Seng Soh, and Lutz Lampe, "Time and Spatial Reuse Handshake Protocol for Underwater Acoustic Communication Networks," *IEEE Journal of Oceanic Engineering*, Oct. 2012.
7. Roe Diamant and Lutz Lampe, "Underwater Localization with Time-Synchronization and Propagation Speed Uncertainties," *IEEE Transactions on Mobile Computing*, issue. 99, vol. PP, 2012.
8. Hwee-Pink Tan, Roe Diamant, Winston K.G. Seah, and Marc Waldmeyer, "A Survey of Techniques and Challenges in Underwater Localization," *ACM Journal of Ocean Engineering*, vol. 38, no. 14, pp. 1663-1676, Oct. 2011.
9. Roe Diamant and Lutz Lampe, "Spatial Reuse TDMA for Broadcast Ad-Hoc Underwater Acoustic Communication Networks," *IEEE Journal of Oceanic Engineering*, vol. 36, no. 2, pp. 172-185, Apr. 2011.

Journal Articles (in review)

1. Roe Diamant, Lutz Lampe and Emmett Gamroth, "Transmitting wide, slow, and shallow: a Bound for Low Probability of Detection for Underwater Acoustic Communication," *submitted to the IEEE Communications Magazine*, Sep. 2014

Conference Proceedings

1. Roe Diamant, Lutz Lampe and Emmett Gamroth, "Low Probability of Detection for Underwater Acoustic Communication," in *IEEE OCEANS Conference*, St. Johns, Canada, Sep. 2014.
2. Roe Diamant, Lars Michael Wolff, and Lutz Lampe, "Utilizing Ocean Current Spatial Correlation for Velocity Estimation of Underwater Drifting Nodes," in *IEEE Workshop on Advances in Network Localization and Navigation (ANLN)*, in ICC, Budapest, Hungary, Jun. 2001.
3. Roe Diamant, Arier Feuer, and Lutz Lampe, "Choosing the Right Signal: Doppler Shift Estimation for Underwater Acoustic Signals," *invited paper* in *ACM Conference on Underwater Networks and System (WUWNet)*, Los Angeles, USA, Nov. 2012
4. Lars Michael Wolff, Roe Diamant, and Lutz Lampe, "Spatial and Temporal Dependencies of Velocities of Underwater Drifting Nodes," (extended abstract) in *ACM Conference on Underwater Networks and System (WUWNet)*, Los Angeles, USA, Nov. 2012
5. H. P. Tan, Xiaoping Ma, Alvin Valera, and Roe Diamant, "A Robust Underwater Networking Stack for Sensing Applications in Singapore Waters," in *the International Waterside Security Conference (WSS)*, Singapore, May 2012.
6. Roe Diamant, Wenbo Shi, Wee-Seng Soh and Lutz Lampe, "Joint Time and Spatial Reuse Handshake Protocol for Underwater Acoustic Communication Networks," in *IEEE OCEANS Conference*, Kona, Hawaii, Sep. 2011.
7. Roe Diamant and Lutz Lampe, "Robust Spatial Reuse Scheduling in Underwater Acoustic Communication Networks," in *IEEE Vehicular Technology Conference (VTC)*, Sep. 2011, San Francisco, USA.
8. Roe Diamant and Lutz Lampe, "Underwater Localization with Time-Synchronization and Propagation Speed Uncertainties," in *IEEE Workshop on Positioning, Navigation and Communication (WPNC)*, Dresden, Germany, Apr. 2011.
9. Roe Diamant, Hwee-Pink Tan, and Lutz Lampe, "NLOS Identification Using a Hybrid ToA-Signal Strength Algorithm for Underwater Acoustic Localization," in *IEEE OCEANS Conference*, Seattle, USA, Sep. 2010.
10. Roe Diamant and Lutz Lampe, "A Hybrid Spatial Reuse MAC Protocol for Ad-Hoc Underwater Acoustic Communication Networks," *invited paper* in *IEEE Workshop on Acoustic Underwater Networks*, in ICC, Cape Town, South Africa, May. 2010.
11. Roe Diamant, Michael Pinchasevich, and Ido Achrak, "A Novel Spatially Shared TDMA protocol and Quality Measure for Ad-Hoc Underwater Acoustic Network," *invited paper* in *IEEE Workshop on Acoustic Underwater Networks*, in AINA, Bradford, England, May. 2009.
12. Roe Diamant, Azriel Sinai, and Shimon Avadis, "A Novel Architecture for Multi-hops routing Ad Hoc Underwater Acoustic Sensor Networking," in *Acoustics Conference*, Paris, France, Jun. 2008.
13. Roe Diamant, Arie Feuer, and Amos Dotan, "Time Reversal MIMO Architecture for Very Shallow Underwater Acoustic Communication," in *IEEE OCEANS Conference*, Aberdeen, Scotland, Jun. 2007.
14. Roe Diamant, and Lotan Horev, "Emulation System for Underwater Acoustic Channel," in *Underwater Defence Technologies (UDT)*, Amsterdam, Netherlands, Jun. 2005.

INVITED TALKS/LECTURES

“Spatial Reuse Underwater Tracking”, Underwater Acoustics Symposium, Tel-Aviv, Israel	2013
“Underwater Link Classification”, Workshop on Intelligent Interference Management and Mitigation, Vancouver, Canada	2013
“Underwater Acoustic Localization: Overview, and connection to tracking problems”, MacDonald, Dettwiler and Associates Ltd. (MDA), Canada	2012
“Digging Out the Dirt of Underwater Acoustic Localization”, Northeastern University, USA	2012
“Machine Learning Approach for Underwater Acoustic Localization”, Woods Hole Institute, USA	2012
“Underwater Acoustic Localization and Time-Synchronization”, University of Connecticut, USA	2012
“Machine Learning Approach for Classifying LOS and NLOS Channels”, Acoustic Research Laboratory, NUS, Singapore	2011
“Utilizing the long propagation delay in Handshake-based Scheduling”, Institute for Infocomm Research, Singapore	2011
“Graph Coloring Approach for Network Scheduling”, IEEE Vancouver Section	2010
“MIMO Time Reversal technique for Underwater Acoustic Communication”, Underwater Acoustics Symposium, Tel-Aviv, Israel	2007

EXTRACURRICULAR ACTIVITIES

Karate Instructor for women who suffered domestic abuse, (Volunteer)	2013-2014
Karate Instructor, Vancouver, Canada	2009-2013
Ski Instructor, Vancouver, Canada	2012-2013
Karate Instructor for Special Needs Children, Israel (Volunteer)	2006-2009
Big Brother, Israel (Volunteer)	2004-2005
Children Group Guide, Israel,	1998-2002
Combat Engineering Officer, Israel,	1994-1998

REFERENCES**Dr. Lutz Lampe, PhD.**

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