

A Synopsis of Research & Professional Activities

Engineering Reports & Seminars:

- التحليل الديناميكي وتصميم الأنابيب البحرية – أرامكو- السعودية:
- 1. "Overview Report on the Dynamic Analysis and Design of Submarine Pipelines, Saudi-ARAMCO Consulting Services Department, August 1990".
- 2. "A Methodology for the Spectral Dynamic Analysis of Submarine Pipelines, Report, Saudi-ARAMCO Consulting Services Department, September 1990.

- تقارير نهائية، وسجل محاضرات دورات دراسية قصيرة عن هندسة الزلازل وتصميم المنشآت لمقاومة الزلازل: كمنسق ومحاضر أعد التقارير النهائية والسجل الكامل لمحاضرات الدورات القصيرة التي قدمت من عام ١٩٩٤م حتى عام ٢٠٠٣م.
- محاضرات علمية قصيرة: قمت بتقديم عدد من المحاضرات القصيرة في قسم الهندسة المدنية و الجامعة كما يلي:
- **Seminars:**
 1. Dynamic Analysis of Helicoidal Bars, Department of Civil Engineering, Graduate Seminar, December 20, 1988.
 2. Analysis of Submarine Pipelines; Saudi-ARAMCO Consulting Services Department, Seminar, September 06, 1989.
 3. Structural Analysis of Helicoidal Bars; Department of Civil Engineering, Graduate Seminar, October 22, 1989.
 4. Mathematical Programming-Based Structural Design; Mini-symposium on Engineering Optimization, Systems Engineering Department-KFUPM, 1996.
 5. Mathematical Programming-Based Design of Cellular Box-Beams, Department of Civil Engineering, Graduate Seminar, October 14, 1997.
 6. Optimal Structural Design Using Genetic Algorithms - A Comparative Study; Department of Civil Engineering, Graduate Seminar, March 3, 1998.

- **Conferences & Workshops:**

1. The Fourth International Conference on Civil and Structural Engineering Computing, CIVIL-COMP 89, City University, London, 19th-21st September, 1989.
2. Teaching Dynamics: A one-week workshop held at King Fahd University of Petroleum and Minerals, Spring 1991, Dhahran, Saudi Arabia.
3. Al-Azhar Engineering Second International Conference, Faculty of Engineering, Al-Azhar University, December 21-24, 1991, Cairo, Egypt.
4. Speciality Conference on Probabilistic Mechanics and Structural and Geotechnical Reliability, July 8-10, 1992, Denver, Colorado, U.S.A.
5. Initiation, development, participation, and coordination of a short course on Earthquake Resistant Structural Designs (completed 16-20 April 1994).
6. Structural Designs via Numerical Optimization – An Overview; Presentation to First KFUPM Mini-symposium on Theory and Applications, May 30, 1995.
7. Initiation, development, participation, and coordination of a short course on Earthquake Resistant Structural Designs (completed 8-12 June 1996).
8. KFUPM-Research Committee & British-Council Sponsored Summer Research: Department of Civil Engineering; University of Wales; United Kingdom; Summer 1997.
9. Fulbright Research Program; KFUPM-Nominee; Proposal: “Optimal Design of Twin-Cells Steel Box-Girders with Frequency Constraints”; 1998-1999.
10. The Saudi Engineering Conferences (3 and 4; November 1991 and 1995).
11. The Saudi First Earthquake Engineering Symposium, King Saud University-Riyadh, September 2000.
12. Symposium on Assessment of Engineering and Technical Education in Saudi Arabia; College of Engineering Sciences-KFUPM, Dhahran; November 1999.
13. The 4th International Conference on Light Weight Steel and Aluminum Structures; Helsinki University of Technology; Aspoo-Finland; June 1999.
14. The 14th Engineering Mechanics Conference; Department of Civil Engineering at the University of Texas at Austin; Austin-Texas, May 2000.
15. The 4th World Congress for Structural and Multidisciplinary Optimization; Joint organization by Dalian University of Technology, China and The Society for Structural and Multi-disciplinary Optimization (ISSMO); Dalian-China, June 4-8, 2001.
16. Advances in Structures: Steel, Concrete, Composite, and Aluminum: Joint organization by Departments of Civil Engineering at the University of Sydney and The University of New South Wales, Australia, June 23-25, 2003.
17. Tenth International conference on Civil, Structural, and Environmental Engineering Computing; Rome-Italy; 30 August – 2 September 2005.

Highlight of Specific Professional Activities:

1. **Chairman** of a session on Earthquake Protection of Structures "Structural isolation"; The Saudi first symposium on earthquake engineering; KSU-Riyadh; 2000.
2. **Chairman** of a session on "Saudi Steel Building Code"; The National Building Code Committee 2nd Workshop on Saudi Structural Designs Building Code; The Saudi Commission on Standards and Specifications; SASO-Riyadh; 2004.
3. **Principal investigator:** A one-year-applied research project KACST LGP 3-15 " *Characterization of key static and dynamic design issues of twin-cell steel box-girders*", 2001.
4. **Coordinator:** for one year on the working group on the development of the first draft of Saudi Steel Buildings Design Code; 2003.
5. **Principal investigator:** A three year-applied research project KACST AT-23-21 " *Multi-criterion optimal designs of RC beams and columns – experimental and analytical studies*", 2005.
6. **Chairman** of a session on "Structural Optimization"; The 10th International Conference on Civil, Structural, and Environmental Engineering Computing; Rome-Italy; 2005.

Funded Research Projects & Reports:

1. Characterization of Key Static and Dynamic Issues of Twin-Cell Steel Box- Girders, Final Report, KACST-LGP-03-15, KACST-Riyadh, February 2002.
2. Multi-criterion Optimal Design of Reinforce Concrete Beams and Columns: Experimental and Analytical Studies, 2nd Progress Report, KACST-AT-23-21, KACST-Riyadh, November 2006.

Refereed Journals & Research Reports/Proposals:

1. Azad, A.K., and **Alghamdi, S.A.**, "Optimization of Built-up Non-uniform Steel I-Beams," Journal of the Structural Division, ASCE, Vol.112, No.8, pp.1982-1986, Aug., 1986.
2. **Alghamdi, S.A.**, "Minimum Weight Design of Linearly Tapered Columns," International Journal of Computers & Structures, Vol.27, No.4, pp.565-569, 1987.
3. **Alghamdi, S.A.**, "The Analysis of Two-Way Linearly Tapered Columns," Int. J. of Computers & Structures, 32(6) 1217-1223, 1989.
4. **Alghamdi, S.A.**, "A Computer Algorithm for the Static Analysis of Helicoidal Bars," Int. J. of Computers & Structures, 43(1), 151-157, 1992.
5. **Alghamdi, S.A.**, "Transport Matrix Algorithm for the Static Analysis of Circular Helicoidal Bars," The Arabian J. for Science and Engineering, 17(1), 35-42, 1992.
6. **Alghamdi, S.A.**, Flexible Multibody System Dynamics - *Theory and Application* (Minguin Xie), *Book Review*, AJSE, Vol. 20, No. 1, January 1995.
7. **Alghamdi, S.A.**, "The Solution of Differential Equations Governing the Static Analysis of a Helicoidal Segment," Int. J. of Computers & Structures, 51(2), 213-223, 1994.
8. **Alghamdi, S.A.**, Mohiuddin, M.A., and Al-Ghamedy, H.N., "Analysis of Free Vibrations of Helicoidal Beams," Int. J. of Engng. Computations, 15(1), 89-102, 1998.
9. **Alghamdi, S.A.**, and Shazali, M.A., "HLXVIB: A Computer Code for Free Vibrations Analysis of Circular Helicoidal Bars," Int. J. of Computers & Structures, 59(6), 1095-1105, 1996.
10. **Alghamdi, S.A.**, and Elbedoor, B. "Free Vibration Analysis of Helicoidal Bars - A Dynamic Stiffness Matrix Procedure," *Unpublished Research Report & Software; completed;* 1996.
11. **Alghamdi, S.A.**, and Boumenir, A.A., "A Numerical Solution for the Differential Equations Governing the Free Vibrations of Space Helicoidal Bars," The Arabian Journal for Science and Engineering, AJSE: (23-2A), 183-193, Dhahran, 1998.
12. **Alghamdi, S.A.**, and El-Boghdadi, M.H., "Optimal Design of Nonuniform Stiffened Three-Spans Steel Beams Using ASD and LRFD Procedures - *A Computer Code*," 1998.
13. **Alghamdi, S.A.**, "Dynamic Stiffness Matrix and Load Functions of Timoshenko Beam Using the Transport Matrix," International J. of Computers and Structures, 79, 1175-1185, 2001.
14. **Alghamdi, S.A.**, Rizwan, M.A., Static and Dynamic Analysis of Cellular Box-Girders - *State of the Art Report*, Department of Civil Engineering, KFUPM-Dhahran, 1998.
15. **Alghamdi, S.A.**, Rizwan, M.A., Characterization of Key Static and Dynamic Design Issues of Twin-Cell Steel Box-Girders, *KACST-LGP Project; Approved* September 1998; Refined Budget SR 70,000.

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16. **Alghamdi, S.A.**, and Al-Amri, A.M., “ The Need for Earthquake Structural Code in Saudi Arabia – *Why and How?*”, *Abstract*; Symposium on Innovation & Distinction in Urban & Infrastructure Development of The Kingdom in 100 Years; Ministry of Public Works and Housing, Riyadh, 1998.
 17. **Alghamdi, S.A.**, “On the Static and Modal Analysis of Twin-Cell Box-Girder Structures,” *AIAA Journal*, September 2001.
 18. **Alghamdi, S.A.**, and Rizwan, M.A., Characterization of Key Static and Dynamic Design Issues of Twin-Cell Steel Box-Girders, *KACST-LGP 3-15*; Final Report, January 2002.
 19. **Alghamdi, S.A.**, “LRFD vs. ASD Automatic Proportioning of Non-uniform Steel Girders – A Computer Code,” *Advances in Design and Engineering Softwares*; Accepted, December 2002.
 20. **Alghamdi, S.A.** and Ahmad S., Experimental and Analytical Multi-criterion Optimal Designs of R/C Beams and Columns, Accepted for KACST funding-2004.
 21. **Alghamdi, S.A.**, "Optimal Shape Design of Non-uniform Steel Beams with Dynamic Constraints"; *J. Engineering Optimization*; Int. Society of Structural & Multi-disciplinary Optimization; accepted 2003.
 22. **Alghamdi, S.A.**, "Transport Matrix Based Dynamic Stiffness Matrix of Circular Helicoidal Bars," *The 10th Int. Conference on Civil, Structural, and Environmental Computing*; Rome-Italy; August 25- September 2, 2005.

Refereed Research Papers in Conferences' Proceedings:

1. Alghamdi, S.A., and Tuma, J.J., "Static Analysis of Helicoidal Bars by the Transport Matrix Equations," Proceedings, 4th. Int. Conference on Civil and Structural Engineering Computing, City University, London, Vol. 1, 247-258, 19-21 September, 1989.
2. Alghamdi, S.A., "Static Analysis of Helicoidal Bars: A Parametric Study," Proceedings, Al-Azhar Engineering 2nd Int. Conference, Vol. IV (Civil Engineering Structures and Construction Technology), 66-89, Cairo, Egypt, December 21-24, 1991.
3. Alghamdi, S.A., "Static Transport Matrix for Thin Rectangular Plates," Proceedings, Saudi 4th Engineering Conference, KAU-Jeddah, Saudi Arabia, 129-136, 5-8 November 1995.
4. Asad, M., Baluch, M., Al-Amoudi, O., Al-Gadhib, A., and Alghamdi, S., "Nonlinear Finite Element Model for Moisture Diffusion in Repair Materials," 2nd ASCE Regional Conference, Beirut, November 1995.
5. Asad, M., Baluch, M., Al-Amoudi, O., Al-Gadhib, A., and Alghamdi, S., "Moisture Diffusion and Shrinkage in Concrete Repair Materials," Saudi 4th Engineering Conference, KAU-Jeddah, Saudi Arabia, 289-294, 5-8 November 1995.
6. Alghamdi, S.A., and Alghamdi, A.S., "Optimal Plastic Design of Nonuniform Beams via the Reduced Gradient Method," Conference Proceedings, Third Asian-Pacific Conference on Computational Mechanics, Seoul, Korea, 16-18 September 1996.
7. Alghamdi, S.A., and El-Boghdadi, M., "Design Optimization of Non-uniform Stiffened Steel Beams - LRFD vs. ASD," Proceedings, The 4th ICSAS Int. Conf. on Steel and Aluminum Structures, Espoo, Finland, 1998.
8. Alghamdi, S.A., and Al-Amri, A.M., "Implementation of Seismic Design Provisions in Saudi Structural Design Code – Why and How," Proceedings, Symposium on Innovation and Distinction in Urban and Infrastructure Development in the Kingdom in 100 Years, Ministry of Public Works and Housing, Riyadh, 203-216, February 7-9, 1999.
9. Alghamdi, S.A., "A Proposed Evaluation Formula to Rejuvenation Distinction of Scientific Research in Physical and Applied Sciences," Proceedings, Symposium on Assessment of Engineering and Technical Education in Saudi Arabia; College of Engineering Sciences-KFUPM, Dhahran; November 1999.
10. Alghamdi, S.A., "On Analysis of Shear Lag in Steel Box Girders," Proceedings, The 14th Engineering Mechanics Conference, Department of Civil Engineering, University of Texas at Austin, May 21-24, 2000.
11. Alghamdi, S.A., "Analysis of Modal Characteristics of Twin-Cell Steel Box Girders," Proceedings, The 14th Engineering Mechanics Conference, Department of Civil Engineering, University of Texas at Austin, May 21-24, 2000.
12. Alghamdi, S.A., "The Saudi Seismic Structural Design Practice," Proceedings, The Saudi First Earthquake Engineering Symposium, Department of Civil Engineering, King Saud University, Riyadh, Saudi Arabia, Nov. 21-24, 2000.
13. Alghamdi, S.A. and Leiva, J.P., "Optimal Shape Design of Twin-Cell Steel Box Girder Structures with Frequency Constraints," Paper No. 267, Proceedings; The 4th World Congress for Structural and Multidisciplinary Optimization (WCSMO-4), Dalian University of Technology, Dalian-China, June 4-8, 2001.

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14. Alghamdi, S.A., Gurdal, Z., and Missoum, S.,” Structural Design of Box-Girder Structures with Static and Frequency Constraints,” Paper No. 266, Proceedings; The 4th World Congress for Structural and Multidisciplinary Optimization (WCSMO-4), Dalian University of Technology, Dalian-China, June 4-8, 2001.
 15. Alghamdi, S. A., and J. P. Leiva," Optimal Shape Design of Design of Non-uniform Built-up Steel Girders with Frequency Constraints," Proceedings, Advances of Structures (Steel, Concrete, Composite and Aluminum), Department of Civil Engineering, University of Sydney & University of New South Wales, Sydney, June 23-25, 2003.
 16. Alghamdi, S. A.," Transport Matrix Based Dynamic Stiffness Matrix of a Circular Helicoidal Bar: A Computer Code', Proceedings of the 10th International Conference on Civil, Structural and Environmental Engineering Computing, Rome-Italy, August 30 – September 2, 2005; pp. 234-240.

Short-courses Coordination & Workshops Participation:

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(Finite Element Based Structural Design Optimization)

"Kettering University, Flint Michigan-USA", March 2000.

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"Structural Health Monitoring (SHM)"

Ecole " –

Superieure de Cachan"

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Membership to Professional Societies & Scholarship Awards:

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1. Member of the ASCE, USA.
 2. Member to the International Association for Bridge and Structural Engineering (IABSE), Zurich, Switzerland.
- (ASCE)
- (IABSE)



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1. KFUPM-British Aerospace Awards, spent respectively at University of Wales at Swansea and at Heriot Watt University, Edinburgh, Scotland, United Kingdom during summers of 1996 and 2005.
2. KFUPM-Fulbright Research Award; Virginia Tech, Blacksburg, USA, 2000.

" British Aerospace"



"Fulbright Research Office - Washington D.C."



"Virginia Tech., Blacksburg, USA "

" British Aerospace Engineering"



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