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RESEARCH OBJECTIVES

Perform research for the development of environmentally friendly road transport vehicles by means of improving the efficiency and reduce emissions of IC engines. I am currently leading Sakarya Air Quality Protection and Improvement ([SAHAKK-I](#)) project research group. Partners of the research group are Sakarya Municipality, Sakarya Governorship and Sakarya University. The overall goal of [SAHAKK-I](#) research group is to provide technical and scientific support to policy makers and relevant stakeholders for sustainable development. This research group carries out an integrated research programme which deals with transport, residential and industrial sourced air pollution, its health effects and corresponding economic losses. SAHAKK-I transport group is currently carrying out Hybrid City Bus Project ([HCB Project](#)) which is mainly focusing on measurement and modeling of real world in-use emissions of Hybrid City Busses. HCB Project is supported by Ministry of Industry and TEMSA R&D Ltd. (city bus manufacturer). My research experience can be summarized as follows:

- Real world emission measurement and inventorying
- Engine modeling (SI engine, Diesel engine)
- Air pollution measurement and control
- HCCI engine
- Alternative fuels (CNG, Biodiesel, Emissions and Performance)
- Knock sensing (vibration sensing)

TEACHING OBJECTIVES

Educate the students for a strong foundation of mechanical engineering fundamentals (IC Engines, Thermodynamics, Combustion, Emissions, Air Pollution Measurement and Control, Heat Transfer) to lead a successful career in industry or government and/or academia for an advanced degree, and contribute to science and community for the development of environmentally friendly energy conversion technologies for real world problems.

Education and Training

Ph.D.

Ph.D. in Mechanical Engineering, Iowa State University, May 2001. Ph.D. dissertation: "Autoignition Modeling of Natural Gas for Engine Modeling Programs: An experimental and modeling study" Skills required to date include:

- Emission measurement and analysis.
- Measurement and analysis of cylinder pressure data.
- Development of a 2 zone thermodynamic model for spark-ignited combustion.
- Development of computer programs for acquisition and analysis of cylinder pressure data.

MS

M.S. in Mechanical engineering, Iowa State University, 1996. M.S. thesis: "Determination of Knock Sensor Location on a Heavy-Duty Natural Gas Engine". Skills required included:

- Measurement and analysis of engine block vibration data
- Development of computer programs for vibration data acquisition and analysis

BS

B.S. in Automotive Education, Gazi University, Turkey, 1988. This program was similar to automotive engineering program in the U.S. and the major courses that I took during the education were as follows:

- Advanced spark-ignited engines theory and workshop
- Advanced diesel engines theory and workshop
- Fuel systems theory and workshop
- Ignition systems theory and workshop
- Power transmission theory and workshop

High School (IC Engine Technician)

I was graduated from Central Vocational and Technical High School of Kayseri in TURKEY in 1981. My major was internal combustion engines. Major technical courses that I took during my education were as follows:

- Spark-ignited engine theory and workshop
- Diesel engine theory and workshop
- Power transmission theory and workshop
- Auto-electric theory and workshop

Work Experience

Associate Professor, Sakarya University (2008 -)

Assistant Professor, Sakarya University (2001 – 2008)

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Educate the students for a strong foundation of mechanical and environmental engineering fundamentals (IC Engines, Thermodynamics, Combustion, Emissions, Air Pollution Measurement and Control, Heat Transfer) to lead a successful career in industry or government and/or academia for an advanced degree, and contribute to science and community for the development of environmentally friendly energy conversion technologies for real world problems. The courses that I thought can be listed as follows:

- IC Engines Emissions and Control Technologies
- Thermodynamics
- Air pollution and control technologies
- Emissions measurement technologies
- Alternative Fuels for Motor Vehicles
- Theory of SI and Diesel Engines

Senior Scientist, European Commission - Joint Research Center (2004 - 2005)

- Fuels and additives for internal combustion engines,
- Emission Inventorying
- Exhaust emission measurement techniques for zero emission vehicles,
- Portable emission measurement systems
- Small engines
- Policy support

Independent Expert (2003 -)

(6&7th Framework Programme, Energy & Transport)

- Evaluation of energy & transport project proposals

Mechanical Engineer, Caterpillar Inc. USA (2000 – 2001)

- Designing, development and simulation of advanced combustion systems for minimization of exhaust emissions (using Multi-dimensional code KIVA).
- Turbocharger matching.
- Cooled EGR engine simulation and analysis for emission reduction.
- Electrical Turbo-compounding engine design, development and simulation.

Research Assistant, Iowa State University (1994-2000)

- CNG engines, engine knock, combustion modeling, autoignition modeling, knock sensors
- Bio-diesel, emission and performance analysis.

Internal Combustion Engine Instructor, Ministry of education and Ministry of Defense (1988 – 1994)

- Had responsibility for teaching various internal combustion engine courses and directing workshops.

Language Skills

Mother tongue: Turkish

2. Language : English (Fluent in speaking, reading, writing)

3. Language : Italian (Beginner)

PUBLICATIONS

A. JOURNAL PUBLICATIONS

A1. Seref Soylu, Estimation of Turkish Road Transport Emissions, ENERGY POLICY, Volume 35, Issue 8, Pages 4088-4094, 2007, 2007.

A2. Schumacher, LG; Soylu, S; Van Gerpen, J; et al., Fueling direct injected diesel engines with 2% biodiesel blend, APPLIED ENGINEERING IN AGRICULTURE, 21 (2): 149-152 MAR 2005.

A3. Seref Soylu, Examination of Combustion Characteristics and Phasing Strategies of Natural Gas HCCI Engine, Energy Conv. And Management, Volume 46, Issue 1, January 2005, Pages 101-119.

A4. Seref Soylu, Prediction of Knock Limited Operating Conditions of a Natural Gas Engine, Energy Conv. And Management, Vol. 46, Issue 1, January 2005, Pages 121-138.

A5. Seref Soylu, Jon Van Gerpen, “Development of empirically based burning rate sub-models for a natural gas engine” Energy Conv. and Management, Vol. 45/14 pp. 467 -481, 2003.

A6. Seref Soylu, Jon Van Gerpen, "Development of an autoignition submodel for natural gas engines" Journal of FUEL, Vol. 82/14 pp. 1699 - 1707, 2003.

A7. Tat, M. E., J.H. Van Gerpen, S. Soylu, M. Canakci, A. Monyem, and S Wormley, "The Speed of sound and Isentropic Bulk Modulus of Biodiesel at 21 degree C from Atmospheric Pressure to 35 MPa," , Journal of the American Oil Chemists' Society, July 1999.

B. INTERNATIONAL CONFERENCE PAPERS

B1. Soylu, S., Gümrükçüoğlu, M., Bal, A., Şentürk, G., Aydınlar B., "Examination of urban transport characteristics and its emissions - Adapazari case study", (Poster no: 064) ETTAP09 17th Transport and Air Pollution Symposium - 3rd Environment and Transport Symposium - June 2-4, 2009 Toulouse (France)

B2. Mahnaz Gümrükçüoğlu ve Şeref Soylu, "Şehiriçi Ulaştırma Kaynaklı Hava Kirliliğinin Coğrafi Bilgi Sistemleri Kullanılarak İzlenmesi (Monitoring of urban transport sourced pollutants by using GIS)", 5th International Conference on Geographic Information Systems, 2-5 July 2008, İstanbul

B3. Mahnaz Gümrükçüoğlu ve Şeref Soylu, "Şehiriçi Ulaştırma Kaynaklı Kirlenici Emisyonların Hesaplanmasında Adapazari Örneği (Analysis of urban transport sourced emissions- Adapazari case study)", Uluslar arası Küresel İklim Değişikliği ve Çevresel Etkileri Konferansı, 18-20 ekim 2007, Konya.

B4. Seref Soylu, "Examination of Combustion Characteristics of an HCCI Engine" COMODIA 2004, August 2-5, Yokohama, Japan, The Sixth International Symposium on Diagnostics and Modeling of Combustion in Internal Combustion Engines, Paper no: 086

B5. Seref Soylu, "Examination of Knock Limits of a Spark Ignited Natural Gas Engine" Proceedings of ICEF04 ASME Internal Combustion Engine Division 2004 Fall Technical Conference Long Beach, CA, USA October 24-27, 2004.

B6. Seref Soylu, "Combustion analysis of a natural gas engine" ICES2003-563 ASME spring conference ICED 2003, Salzburg, Austria, 2003.

B7. Seref Soylu, "Simple Modeling of Combustion for Natural Gas Engines", SAE Paper no: 2002-01-2733, 2002

B8. Seref Soylu "Prediction of Knock Limited Operating Conditions of a Natural Gas Engine . " Automotive Technologies Congress, June 24-26, 2002, Uludağ Üniversitesi, Bursa.

B9. Van Gerpen, J.H., S. Soylu, and M.E. Tat, " Evaluation of the Lubricity of Soybean Oil-based Additives in Diesel Fuel," ASAE Paper No 996134, presented at the American Society of Agricultural Engineers 1999 Annual Meeting, Toronto, Canada, July 1999.

B10. Schumacher, L. G., Seref Soylu, J. Van Gerpen, W. Wetherell, "Fueling Direct Injected Diesel Engines with 2% Biodiesel Blend." , ASAE 98-6084, 1998.

B11. Seref Soylu and J. Van Gerpen, "Fuel Effects on the Knocking Limit of a Heavy-Duty Natural Gas Engine." SAE Paper No 981401, 1998.

B12. Seref Soylu and J. Van Gerpen, "Determination of Knock sensor Location on a Heavy-duty Natural Gas engine." SAE Paper No 971705, 1997.

E. NATIONAL CONFERENCE PAPERS

E1. Otomobiller için alternatif enerji kaynaklarının incelenmesi, II. Ulusal Ege Enerji Sempozyumu, Kutahya, 26-28 Mayıs, 2004

F. OTHERS

Legislative works

Seref Soylu, Overview of the US EPA Certification Standards for Deposit Control Additives (DETERGENTS), European Commission – JRC, Review of Directive 98/70/EC as amended by directive. 2003/17/EC relating the quality of petrol and diesel fuel., 05.04.2005 European Commission, BRUSSELS.