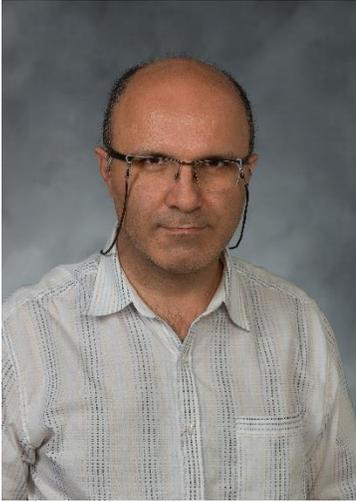




UAA College of Engineering
UNIVERSITY of ALASKA ANCHORAGE



UAA Professional Development Seminar Series

Sustainable Power Production by Biomass Gasification Internal Combustion Engine

Presented by Farshid Zabihian, ME
Department, California State University,
Sacramento

In this research, the performance of a small scale, downdraft gasifier internal combustion engine is evaluated. Varying compositions of agricultural wastes, such as wood chips and walnut shells as means of biofuel, affect the efficiency and overall performance of the gasification processes and engine combustion. Operational parameters, such as the temperature of the gasification bed, electrical output, feedstock consumption, specific gasification rate and emissions, are analyzed to observe the characteristics of the gasification system using different biomass fuels. The experiments indicated that the downdraft gasifier engine operated at higher bed temperatures and higher specific gasification rates when using woodchips at various electric loads. However, the system's overall efficiency is higher when using walnut shells, ranging from 13% to 17% compared to 9% to 11% when using woodchips. In addition, the experiments established the optimum air-to-fuel ratio set points for both biofuels by evaluating the emissions.

Farshid Zabihian is currently an Assistant Professor in the Department of Mechanical Engineering at California State University, Sacramento. He received his M.A.Sc. and B.Sc. in Mechanical Engineering from Iran University of Science and Technology in 1998, and Amirkabir University of Technology, Iran in 1996, respectively. He worked in the energy industry for eight years in various capacities, before returning to academia. He received his Ph.D. in Mechanical Engineering in 2011 from Ryerson University, Canada. His dissertation was on modeling of advanced hybrid power generation systems, particularly fuel cells. He was the recipient of the Governor General's Academic Gold Medal, the highest academic honor at the graduate level in Canada. He was previously an assistant professor at West Virginia University Institute of Technology between 2011 and 2016. He joined Sacramento State in 2017.

Friday, September 20, 2019

11:45 am-12:45 pm

UAA College of Engineering, EIB 211