

Georgia Southern University

Digital Commons@Georgia Southern

Engineering & Computing, Allen E. Paulson
College of - News

Engineering and Computing College
Publications

4-8-2022

College of Engineering News

Georgia Southern University

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/cec-news>

This news article is brought to you for free and open access by the Engineering and Computing College Publications at Digital Commons@Georgia Southern. It has been accepted for inclusion in Engineering & Computing, Allen E. Paulson College of - News by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.

Two PCEC Faculty Awarded NSF Engineering Research Initiation (ERI) Grants

April 8, 2022

The [National Science Foundation's Engineering Research Initiation \(ERI\)](#) program has announced that it will award grants worth about \$200,000 each to two Georgia Southern faculty members in the Paulson College of Engineering and Computing. Aiming to broaden the base of investigators involved in engineering research, the ERI program provides support to new investigators early in their research program to advance their careers as researchers, educators, and innovators. Each investigator receives a grant of about \$200K to be used over a two-year period for those purposes.

[Dr. Prakashbhai Bhoi](#), assistant professor of [Mechanical Engineering](#), submitted a proposal titled "[Elucidating co-gasification of biochar and waste mixed plastics to produce low-cost, net-zero carbon, hydrogen-enriched syngas for polygeneration systems.](#)" Syngas (a fuel gas mixture consisting primarily of H₂, CO, and often some CO₂), through the co-gasification (turning into (hydrogen) gas) of biochar (a sort of charcoal produced from biomass sources) and waste mixed plastics, holds great promise as a clean alternative to fossil fuels for polygeneration systems (interdependent power systems such as solar, wind, and hydro that provide backup for each other).

To achieve our net-zero emissions goal by 2050, the U.S. is prioritizing decarbonization of the transportation, aviation, and energy-generation sectors. However, hydrogen is now produced primarily through steam methane reforming and coal-gasification processes that both emit significant CO₂, exacerbating climate change. Dr. Bhoi's ERI project is designed to address two major environmental threats simultaneously: eliminate CO₂ from the clean hydrogen fuel (syngas) production pathway; and reducing the amount of waste mixed plastics now dumped in landfills and our oceans.

[Dr. Seungmo Kim](#), assistant professor of [Electrical and Computer Engineering](#), submitted a proposal titled "Driving Risk-Initiated Vehicle-to-Everything Communications (DRIVEcomm)." This work addresses the issue of vehicle-to-everything (V2X) communications — despite the rapid evolution of V2X communications, successful exchange of safety messages still remains an ambitious task, mainly due to the high mobility and dynamicity of vehicular systems, Dr. Kim writes. As more vehicles are interconnected and autonomous vehicles become more prevalent, the number of wirelessly exchanged messages will explode logarithmically, which will also seriously negatively impact the success of message exchange. In an effort to address this problem, Dr. Kim proposes to carefully define the priority of transmitted information and prioritize channel access among vehicles. He will develop a "testbed" to implement the risk-based prioritization among safety message types, and prove theoretical performance bounds for a proposed V2X communications framework.

Both research projects will also provide hands-on training in experimental and modeling approaches for students (graduate and undergraduate), as well as community outreach, and collaboration with local, regional, and national stakeholders in order to disseminate the lessons learned.

Posted in [CEC News](#)