[illegible] 2024

[illegible], PhD

[illegible] of Mechanical Engineering;
Program Director of Materials Science
and Engineering, Baylor University

9:00 to 9:50 am – November 15, 2024
Galloway [illegible] Busin[illegible] [illegible] 101

[illegible] ence and Engineering. He has authored more than 100 journal and conference publications, holds twenty patents, and produced twelve FAA 8100-9 certifications. His [illegible] crosses physics-based constitutive modeling, composites characterization, and non-destructive testing and [illegible] who are pioneers in [illegible] non-destructive testing methods. He has been awarded over [illegible]

LECTURE: Establishing the Digital Twin from Nondestructive Inspection Data

The use of carbon fiber reinforced materials has become mainstream in the aerospace, automotive, and sporting industries due to their versatility, performance, and high strength to weight ratio. Parts are often designed under a [illegible] assumption, and the [illegible] a factor of safety approach. [illegible] The present work presents a new [illegible] captured using non-destructive techniques and then incorporated into a finite element simulation allowing for [illegible] to quantify using non-destructive testing of a [illegible] service induced defects. This work presents a novel method to nondestructively characterize the internal features [illegible] was designed, part performance [illegible] three-dimensional image of internal features, and results are compared to those from micro-X-ray computed tomography and are in excellent [illegible] incorporated into a finite element model [illegible] finite element results for the strain field [illegible] compared to results of the strain field during loading from digital image correlation (DIC). The novelty of the presented method is the combination of physical testing, non-destructive testing for the geometric extraction [illegible] structural predictions using inspection data directly thus closing the loop of the true digital twin.

[illegible]