A JOURNEY THROUGH COMPOSITE MATERIALS AND STRUCTURES: A PERSONAL RETROSPECTIVE

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This is a personal retrospective of the author’s journey through mechanics of composite materials and structures over the last 42 years. Along the way the author has collaborated with a large number of students and colleagues, who have enriched his contributions to the subject. The authors work on the subject began with an association with Professor Charles Bert (University of Oklahoma), which paved the way for the author’s professional journey through composite materials and structures. The publication of papers on third-order theory [1], layerwise theory [2], a book [3] on laminated composite plates, and founding a journal (Mechanics of Composite Materials and Structures now known under the title Mechanics of Advanced Materials and Structures) were the main milestones of the authors earlier works. In the second half of the authors career, he and his colleagues (students as well as fellow researchers) have developed least-squares-based finite element models of layerwise theory, finite element models of functionally graded plates and shells, and seven- and twelve-parameter shell theories and their finite elements for laminated composite structures. The author’s recent research on nonlocal elasticity and couple stress theories in formulating the governing equations of functionally graded material beams and plates will also be discussed. In addition, the graph-based finite element framework (GraFEA) suitable for the study of damage in brittle materials will be discussed.

References

