

Rama Chandra Murthy, A.; Palani, G. S.; Iyer, Nagesh R.

Object-oriented programming paradigm for damage tolerant evaluation of engineering structural components. (English) [Zbl 1283.74098](#)

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Summary: This paper proposes a new fracture mechanics based OOP tool for damage tolerant evaluation of cracked structural components including tubular joints subjected to constant and variable amplitude loading. To meet requirements of damage tolerant evaluation of structural components, interactive and user-friendly software, has been developed by using OOP concepts. Application of OOP concepts with class and sequence diagrams generated using unified modified language (UML) design tool has been explained with reference to the software. Graphical user interface (GUI) has been developed using VC++, which acts as a client at the front end, while the database developed using MS-ACCESS-XP acts as the server at the back-end. Database design for typical structural components with different crack configurations has been shown in the form of tables. The details of various program modules and structure of GUI have been outlined. Number of benchmark problems has been solved through GUI for verification and validation. The efficacy of the software has been illustrated through an example problem.

MSC:

74S30 Other numerical methods in solid mechanics (MSC2010)

74R99 Fracture and damage

Keywords:

damage tolerant evaluation; fracture mechanics; object-oriented programming; crack growth; remaining life; residual strength

Software:

Access; Visual C++

Full Text: [DOI](#)

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