Paraskevas Papanikos

Mechanical Engineer (NTUA), M.A.Sc. (Toronto), Ph.D. (Toronto)
Assistant Professor
Engineering Mechanics

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RESEARCH AREAS

- Finite element modelling of structures and processes
- Strength of metals and composites
- Fatigue of metallic and composite structures
- Analytical and experimental fracture mechanics
- Mechanical behavior of nano-structures

EDUCATION

1989 **Diploma** in Mechanical Engineering
National Technical University of Athens

1992 **M.A.Sc**. in Applied Mechanics
Dept. of Mechanical Engineering, University of Toronto.

1997 **Ph.D.** in Applied Mechanics
Dept. of Mechanical Engineering, University of Toronto.

PROFESSIONAL EXPERIENCE

1999-2004 Research coordinator
Institute of Structures and Advanced Materials (ISTRAM)
Patras, Greece

2004-2006 Lecturer (P.D. 407)
Department of Product and Systems Design Engineering
University of the Aegean

2006- Assistant Professor
Department of Product and Systems Design Engineering
University of the Aegean

TEACHING EXPERIENCE

University of the Aegean
Department of Product and Systems Design Engineering

- *Engineering Mechanics (Statics & Mechanics of Materials)*
- *Physics for Engineers*
- *Computational Mechanics*
- *Analysis and Design of Mechanisms*

RESEARCH PROJECTS

Dept. of Mechanical Engineering, University of Toronto (1990-1997):

- Design and Analysis of Dovetail Joints in Aeroengine Discs
- Fatigue Behaviour of Aeroengine Compressor Assemblies
- Three-Dimensional Finite Element Analysis of Cold Hole Expansion for Aerospace Applications
- Fatigue Fracture Behaviour of Interacting Holes
- Effect of Residual Stresses upon the Fatigue Behaviour of Airframe Alloys
- Finite Element Analysis of the Shot Peening Process
- Biomechanical Analysis of Dental and Orthopedic Implants
- FEM in Design of Recreational Equipment

Institute of Structures and Advanced Materials (ISTRAM), Patras, Greece (1999-2005):

- Efficient Design and Verification of Composite Structures (EDAVCOS) - Funding agent: European Union(BRITE/EURAM) - Coordinator: SAAB - Project duration: 1/2/98-31/1/01
- Integrated Design Environment for Simulation and Numerical Analysis of Production Processes (D-SIGN) - Funding agent: European Union(BRITE/EURAM) - Coordinator: ESI - Project duration: 1/8/98-30/11/01
- Services for Collaborative SMEs Aeronautical Technical Research (SCRATCH) - Funding agent: European Union - Coordinator: EuroInter - Project duration: 1/2/99-30/9/00
- Bolted Joints in Composite Aircraft Structures (BOJCAS) - Funding agent: European Union(GROWTH) - Coordinator: Un. Limerick - Project duration: 1/2/00-31/5/03
- Technology Application to the Near Term Business Goals and Objectives of the Aerospace Industry (TANGO) - Funding agent: European Union(GROWTH) - Coordinator: AIRBUS - Project duration: 1/4/00-31/3/05
- Services for Collaborative SMEs Aeronautical Technical Research II (SCRATCH II) - Funding agent: European Union - Coordinator: EuroInter - Project duration: 1/10/00-31/3/01
- Advanced Design Concepts and Maintenance by Integrated Risk Evaluation for Aerostructures (ADMIRE) - Funding agent: European Union(GROWTH) - Coordinator: ALENIA - Project duration: 1/2/01-31/7/04
- Improve and Assess Repair Capability of Aircraft Structures (IARCAS) - Funding agent: European Union(GROWTH) - Coordinator: AIRBUS - Project duration: 1/7/01-31/12/05
- Investigation on Damage Tolerance Behaviour of Aluminium Alloys (IDA) - Funding agent: European Union(GROWTH) - Coordinator: AIRBUS - Project duration: 1/1/02-31/12/04
- Services for Collaborative SMEs Aerospace Technical Research 3 (SCRATCH 3) - Funding agent: European Union - Coordinator: EuroInter - Project duration: 1/5/02-29/2/04
- Development of Innovative and Advanced Laminates for Future Aircraft Structure (DIALFAST) - Funding agent: European Union(STREP) - Coordinator: AIRBUS - Project duration: 1/1/04-31/12/06

National Technical University of Athens (2004-2006):

- Deformation measurement in FRP reinforced concrete structures using geodetic methods and fibre sensors, Programme Pythagoras, EPEAEK, 2004-2006.

University of the Aegean (2006-):

- Structural health monitoring of glass-reinforced composites using embedded CNT fibers - Funding agent: Latsis Foundation - Coordinator: NTUA - Project duration: 1/1/10-31/12/10.
- Experimental and theoretical investigation of mechanical properties degradation of the aeronautical Aluminum alloy 2024 due to corrosion, Archimedes III Programme, 2012-2015.

Evaluator of Research Proposals

05/2000	Evaluator of research proposals after invitation from the Research Directorate of the European Commission for the programme GROWTH/AERONAUTICS 2000.
05/2001	Evaluator of research proposals after invitation from the Research Directorate of the European Commission for the programme GROWTH/AERONAUTICS 2001.
05/2003	Evaluator of research proposals after invitation from the Research Directorate of the European Commission for the programme STREP/AERONAUTICS 2003.

Reviewer for Scientific Journals

Reviewer for: Composites part B: Engineering, Composite Structures, Computational Materials Science, Materials Science and Engineering A, International Journal of Fatigue, International Journal of Solids and Structures, Carbon, Journal of Physics and Chemistry of Solids, Mechanics of Advanced Materials and Structures, Journal of Materials Science.

PUBLICATIONS

A. THESES AND BOOK CHAPTERS

A1. P. Papanikos, *On the structural integrity of dovetail joints in aeroengine discs*, M.A.Sc. Thesis, University of Toronto, 1992.

A2. P. Papanikos, *Mechanics of mixed mode fatigue behaviour of cold worked adjacent holes*, Ph.D. Thesis, University of Toronto, 1997.

A3. Sp. Pantelakis and P. Papanikos, in *Problems of fracture mechanics and fatigue: A solution guide*, edited by E.E. Gdoutos, C.A. Rodopoulos and J.R. Yates, Kluwer Academic Publishers, 2003.

B. JOURNALS

B1. P. Papanikos and S.A. Meguid, Theoretical and experimental studies of fretting-initiated fatigue failure of aeroengine compressor discs, *Fatigue and Fracture of Engineering Materials and Structures*, 17(5), 539-550, 1994.

B2. S.A. Meguid, M.H. Refaat and P. Papanikos, Theoretical and experimental studies of the structural integrity of dovetail joints in aeroengine discs, *Journal of Materials Processing Technology*, 56, 668-677 1996.

B3. P. Papanikos, S.A. Meguid and Z. Stjepanovic, Three dimensional nonlinear finite element analysis of dovetail joints in aeroengine discs, *Finite Elements in Analysis and Design*, 29(3-4), 173-186, 1998.

B4. P. Papanikos and S.A. Meguid, Three dimensional finite element analysis of cold expansion of adjacent holes, *International Journal of Mechanical Sciences*, 40(10), 1019-1028, 1998.

B5. X.D. Wang, S.A. Meguid and P. Papanikos, Analysis of curved cracks emanating from adjacent holes, *Engineering Fracture Mechanics*, 64, 337-355, 1999.

B6. P. Papanikos and S.A. Meguid, Elasto-plastic finite element analysis of cold expansion of adjacent fastener holes, *Journal of Materials Processing Technology*, 93, 424-428, 1999.

B7. Sp.G. Pantelakis, Em.Ch. Kyriakakis and P. Papanikos, Non-destructive fatigue damage characterization of laminated thermosetting fibrous composites, *Fatigue and Fracture of Engineering Materials and Structures,* 24(10), 651-662, 2001.

B8. K.I. Tsepres, P. Papanikos and Th. Kermanidis, A three-dimensional progressive damage model for bolted joints in composite laminates subjected to tensile loading, *Fatigue and Fracture of Engineering Materials and Structures,* 24(10), 663-676, 2001.

B9. K.I. Tserpes, G. Labeas, P. Papanikos and Th. Kermanidis, Strength prediction of bolted joints in graphite/epoxy composite laminates, *Composites Part B: Engineering*, 33(7), 521-529, 2002.

B10. P. Papanikos, K.I. Tserpes and Sp.G. Pantelakis, Modelling of fatigue damage progression and life of CFRP laminates, *Fatigue and Fracture of Engineering Materials and Structures*, 26, 37-47, 2003.

B11. S.A. Tsirkas, P. Papanikos, Th. Kermanidis, Numerical simulation of the laser welding process in butt-joint specimens, *Journal of Materials Processing Technology*, 134, 59-69, 2003.

B12. S.A. Tsirkas, P. Papanikos, K. Pericleous, N. Strusevich, F. Boitout, J.M. Bergheau, Evaluation of distortions of laser welded shipbuilding parts using local-global finite element approach, *Science and Technology of Welding and Joining*, 8(2), 79-88, 2003.

B13. K.I.Tserpes, P. Papanikos, G. Labeas, Sp. Pantelakis, Fatigue damage accumulation and residual strength assessment of CFRP laminates, *Composite Structures*, 63(2), 219-230, 2004.

B14. P.V. Petroyiannis, Al.Th. Kermanidis, P. Papanikos, Sp.G. Pantelakis, Corrosion-induced hydrogen embrittlement of 2024 and 6013 aluminium alloys, *Theoretical and Applied Fracture Mechanics*, 41(1-3), 173-183, 2004.

B15. M.A. Kattis, P. Papanikos, E. Providas, Thermal Green's functions in plane anisotropic bimaterials, *Acta Mechanica*, 173 (1-4), 65-76, 2004.

B16. P. Papanikos, K.I. Tserpes, G. Labeas, Sp. Pantelakis, Progressive damage modelling of bonded composite repairs, *Theoretical and Applied Fracture Mechanics*, 43(2), 189-198, 2005.

B17. K.I. Tserpes and P. Papanikos, Finite element modelling of single-walled carbon nanotubes, *Composites Part B: Engineering*, 36, 468-477, 2005.

B18. K.I. Tserpes, P. Papanikos, S.A. Tsirkas, A progressive fracture model for carbon nanotubes, *Composites Part B: Engineering*, 37, 662-669, 2006.

B19. K.I. Tserpes and P. Papanikos, The effect of Stone-Wales defect on the tensile behavior and fracture of single-walled carbon nanotubes, *Composite Structures*, 79(4), 581-589, 2007.

B20. P. Papanikos, K.I. Tserpes and Sp. Pantelakis, Initiation and progression of composite patch debonding in adhesively repaired cracked metallic sheets, *Composite Structures*, 81(2), 303-311, 2007.

B21. K.I. Tserpes, P. Papanikos, G. Labeas and Sp. Pantelakis, Multi-scale modeling of tensile behaviour of carbon nanotube reinforced composites, *Theoretical and Applied Fracture Mechanics*, 49(1), 51-60, 2008.

B22. P. Papanikos, D.D. Nikolopoulos and K.I. Tserpes, Equivalent beams for carbon nanotubes, *Computational Materials Science*, 43(2), 345-352, 2008.

B23. A.D. Alexopoulos and P. Papanikos, Experimental and theoretical studies of corrosion-induced mechanical properties degradation of aircraft 2024 aluminium alloy, *Materials Science and Engineering A*, 498, 248-257, 2008.

B24. K.I. Tserpes and P. Papanikos, Continuum modeling of carbon nanotube-based super-structures, *Composite Structures*, 91, 131-137, 2009.

C. CONFERENCE PROCEEDINGS

C1. S.A. Meguid, P. Papanikos and M.H. Refaat, Finite element analysis of dovetail joints in aeroengine discs using interface elements, *Proceedings of the International Conference on Computational Methods in Engineering*, Singapore, November 1992.

C2. P. Papanikos and S.A. Meguid, Fatigue failure of dovetail joints in aeroengine discs, *Proceedings of Fatigue '93*, pp. 465-470, Montreal, Canada, May 1993.

C3. S.A. Meguid, M.H. Refaat and P. Papanikos, Theoretical and experimental studies of structural integrity of dovetail joints in aeroengine discs, *Proceedings of the International Conference on Advances in Materials and Processing Technologies*, pp. 1539-1547, Dublin, Ireland, August 1993.

C4. S.A. Meguid and P. Papanikos, Evaluation of the structural integrity of aeroengine compressor discs using fracture mechanics, *Proceedings of the 10th International Conference on Experimental Mechanics*, pp. 443-448, Lisbon, Portugal, July 1994.

C5. P. Papanikos and S.A. Meguid, Fatigue crack growth behaviour of interacting holes in airframe alloys, *Proceedings of Mechanics in Design, Canadian Society for Mechanical Engineering Forum*, pp. 731-739, Toronto, Canada, May 1996.

C6. S.A. Meguid, P. Papanikos, Z. Stjepanovic and J. Najar, Three dimensional finite element analysis of an aeroengine compressor disc assembly,

Proceedings of the 2nd International Conference on the Application of Numerical Methods in Engineering, pp. 62-68, Serdang, Malaysia, June 1997.

C7. P. Papanikos and S.A. Meguid, Elasto-plastic finite element analysis of cold expansion of adjacent fastener holes, *Proceedings of the 3rd International Conference on Advances in Materials and Processing Technologies (AMPT'97)*, pp. 799-804, Guimaraes, Portugal, July 1997.

C8. S.A. Meguid and P. Papanikos, Mechanics of the cold hole expansion of aerospace components (Invited Keynote Lecture), *International Conference on Experimental Mechanics*, Porto, Portugal, March 1998.

C9. Sp. Pantelakis, Em.Ch. Kyriakakis and P. Papanikos, Fatigue damage of laminated fibrous composites, *Proceedings of MesoMechanics 2000*, pp. 1057-1066, Xi'an, China, June 2000.

C10. Al.Th. Kermanidis, P. Papanikos and Sp.G. Pantelakis, Mesodamage of 2024-T3 aluminum alloy specimen due to corrosion-induced localized hydrogen embrittlement, *CD-ROM Proceedings of the Tenth International Conference on Fracture*, Hawaii, December 2001.

C11. P. Papanikos and K.I. Tserpes, Modelling the tensile behavior of composite bolted joints, *CD-ROM Proceedings of the 4th GRACM Congress on Computational Mechanics, GRACM 2002*, Patras, Greece, 27-29 June, 2002.

C12. P. Papanikos and Al.Th. Kermanidis, Effect of corrosion-induced hydrogen embrittlement on the fracture toughness of 2024-T3 aluminum alloy, *Proceedings of the Mesomechanics 2002 Conference*, pp. 627-633, Aalborg, Denmark, August 2002.

C13. Th. Kermanidis, S.A. Tsirkas, P. Papanikos, Effect of laser welding parameters on the distortion of thin ship panels, *International Conference on Manufacturing Engineering* (ICMEN), pp. 691-700, Thessaloniki, Greece, October 2002.

C14. Th. Kermanidis, K.I. Tserpes, P. Papanikos, G. Labeas and Sp. Pantelakis, Fatigue damage accumulation and residual strength assessment of composite laminates through progressive damage modelling, *Proceedings of the Mesomechanics 2003 Conference*, pp. 167-174, Tokyo, Japan, 26-28 August 2003.

C15. V. Karatzaferis, M.A. Kattis, M.A. and P. Papanikos, Analysis of the bond-slip behaviour of FRP reinforcing bars in concrete, *Proceedings of the 6th Mesomechanics Conference*, pp. 446-451, Patras, May 31-June 4, 2004.

C16. P. Papanikos, K.I. Tserpes and G. Labeas, Progressive damage modelling of bonded composite repairs, *Proceedings of the 6th Mesomechanics Conference*, pp. 452-458, Patras, May 31-June 4, 2004.

C17. M. Tsakiri, C. Ioannidis, P. Papanikos and M.A. Kattis, Load testing measurements for structural assessment using geodetic and photogrammetric techniques, *1st FIG International Symposium on Engineering Surveys for Construction Works and Structural Engineering*, Nottingham, UK, June 28-July 1, 2004.

C18. V. Karatzaferis, M. Kattis, P. Papanikos, Local shear-slip behavior in FRP reinforced concrete elements under cyclic loading, *Proceedings of the 15th Hellenic Concrete Conference*, Alexandroupolis, Greece, October 25-27, 2006 (in Greek).

C19. K.I. Tserpes and P. Papanikos, Tensile behavior and fracture of carbon nanotubes containing Stone-Wales defects, *Proceedings of the 16th European Conference of Fracture*, pp. 39-40, Alexandroupolis, Greece, June 3-7, 2006.

C20. K.I. Tserpes, P. Papanikos and Sp. Pantelakis, Continuum modelling of interfacial load transfer in carbon nanotube/polymer composites subjected to tension and bending, *Proceedings of the Mesomechanics 2008 Conference*, Cairo, Egypt, Jan 28-Feb 1, 2008.

C21. F.S. Efthimiou, P. Papanikos, K.I. Tserpes and Sp. Pantelakis, Continuum simulation of tensile, bending and torsional rigidities of multi-walled carbon nanotubes, Proceedings of the 9th HSTAM International Congress on Mechanics, Limassol, Cyprus, 12 – 14 July, 2010.

C22. K.I. Tserpes, P. Papanikos, Fracture behavior and strength of graphemes containing randomly dispersed defects, Proceeding of the 2nd International Conference of Engineering Against Fracture (ICEAF), Mykonos, Greece, June 22-24, 2011.

C23. P. Papanikos, K.I. Tserpes, Stiffness evaluation of polymers reinforced by specifically or randomly distributed carbon nanotubes, Proceedings of the 16th International Conference on Composite Structures (ICCS 16), Porto, Portugal, June 28-30, 2011.

C24. K.I. Tserpes, P. Papanikos and Sp. Pantelakis, Numerical study of carbon nanotube-based crack growth enhancement in polymers, Proceedings of the 16th International Conference on Composite Structures (ICCS 16), Porto, Portugal, June 28-30, 2011.

C25. P. Papanikos, P. Poulin, C. Bartholome, S.K. Kourkoulis and N.D. Alexopoulos, Characterization of PVA-CNT fiber's mechanical behavior: Testing and finite element modeling, Proceedings of the 16th International Conference on Composite Structures (ICCS 16), Porto, Portugal, June 28-30, 2011.

CITATIONS

The number of citations (April 2012) is 576 (source: SCOPUS) and 486 (source: Thomson Scientific – ISI).