Vladimir Gantovnik

Qualifications

- Highly motivated engineer with aerospace research experience and successful record of developing new ideas and products.
- Solid educational credentials including a Ph.D. in Mechanics, M.S. in Materials Science, and M.S. in Aerospace Engineering.
- Broad engineering background associated with structural design, analysis, and optimization.

Education

2000–2005 **Ph.D., Engineering Science & Mechanics**, *Virginia Polytechnic Institute and State University (Virginia Tech)*, Blacksburg, VA.
Dissertation: An improved genetic algorithm for optimization of composite structures. Committee: Prof. Zafer Gürdal (Advisor), Prof. Layne Watson, Prof. Liviu Librescu, Prof. Eric Johnson, Prof. Mahendra Singh

1998–1999 **M.S., Materials Science & Engineering**, *Iowa State University*, Ames, IA.
Thesis: Micro-structural relationships of heavily deformed Au-Ag and Au-Pt composites. Advisor: Prof. Alan M. Russell

1992–1998 **M.S., Aerospace Engineering, *summa cum laude***, *Siberian State Aerospace University*, Krasnoyarsk, Russia.
Thesis: Bending of a sandwich composite toroidal shell stiffened by rings under external pressure. Advisor: Prof. Alexander V. Lopatin

2014–2015 **Graduate Certificate, Management Science and Engineering**, *Stanford University*, Stanford, CA.
UTC Employee Scholar Program

Experience

03/2017–current **Staff Stress Engineer**, *UTC Aerospace Systems*, Chula Vista, CA.
GTF CSeries and Embraer E2 Programs: Structural analysis and sizing support of components of nacelle thrust reverser. Patran/Nastran, VBA, Perl, Python, iSight, Nastran SOL200, HyperMesh, OptiStruct. UTAS Subject Matter Expert (SME) in Structural Optimization.

10/2011–02/2017 **Stress Engineer**, *UTC Aerospace Systems/Goodrich Aerostructures*, Chula Vista, CA.
GTF CSeries/MRJ and Airbus A350XWB Programs: Structural analysis and sizing support of components of nacelle thrust reverser. Patran/Nastran, VBA, Perl, iSight, Nastran SOL200, HyperMesh, OptiStruct.

02/2011–06/2011 **Structural Engineer**, *LightSail Energy*, Oakland, CA.
Venture capital-funded start-up company. Company is in a stealth mode, and everything related to LightSail Energy is top-secret classified. Project: Design of composite ultra-high-pressure vessels for compressed-air energy storage (CAES) system. Matlab, Ansys.

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06/2007–10/2010 **Postdoctoral Associate**, *University of North Carolina at Charlotte, Department of Bioinformatics and Genomics*, Charlotte, NC.
Project: Modeling of competitive DNA hybridization and kinetics for the purpose of predicting binding outcomes on DNA microarray. Perl, Mathematica, R, VisualOMP. Funded by NIH.

09/2005–06/2007 **Research Associate**, *Clemson University, Department of Mechanical Engineering*, Clemson, SC.
Project: Multivariate optimization, packing and configurational vehicle design for the Family of Medium Tactical Vehicles (FMTV). Pro/E, Fortran, Mathematica. Funded by U.S. Army TACOM.

09/2004–08/2005 **Graduate Research Assistant**, *Virginia Tech, Center for High Performance Manufacturing*, Blacksburg, VA.
Project: 3D Printing of Precious Metal Composites. SolidWorks modeling. Funded by ExOne/Extrude Hone Cortporation and Hoover & Strong.

05/2000–08/2004 **Graduate Research Assistant**, *Virginia Tech, Department of Engineering Science & Mechanics*, Blacksburg, VA.
Project: Optimization of composite structures by an improved genetic algorithm. Ansys, Fortran. Funded by Air Force Office of Scientific Research (AFOSR).

02/1998–05/2000 **Graduate Research Assistant**, *Ames National Laboratory, Metallurgy and Ceramics Division*, Ames, IA.
Project: Deformation processed Au-Ag and Au-Pt composites.

08/1997–02/1998 **Graduate Research Assistant**, *Siberian Aerospace Academy, Department of Computer Modeling*, Krasnoyarsk, Russia.
Project: Analysis and design of toroidal composite shell. Nastran, Fortran, AutoCAD

08/1995–08/1997 **Intern Mechanical Engineer**, *The Krasnoyarsk Machine-Building Plant, Research Composite Laboratory*, Krasnoyarsk, Russia.
Project: Development of plasma surface coatings for advanced materials.

Skills

Programming	VBA, Python, C++, Java, Perl, Fortran, R, Mathematica, Matlab, Maple
FEA	MSC Patran/Nastran, Altair HyperWorks, Ansys, Femap, Abaqus, Comsol Multiphysics, HyperSizer, VR&D Genesis
CAE	Catia, SolidWorks, Pro/Engineer, AutoCAD
Structural Optimization	Simulia iSight, Nastran SOL200, Altair OptiStruct, Altair HyperStudy, modeFrontier, VR&D VisualDOC

Awards

2007–2009 **Richard Priory Postdoctoral Fellowship**, *Duke Energy*, Charlotte, NC.

2000–2005 **Graduate Research Fellowship**, *ESM, Virginia Tech*, Blacksburg, VA.

2000 **Ames Laboratory Inventor Incentive Award**, *AmesLab*, Ames, IA.

2000 **The International Precious Metals Institute (IPMI), Outstanding Work Award in Precious Metal Research** , *Iowa State University*, Ames, IA.

1998-1999 **L.W. Huncke Foundation Scholarship**, *Iowa State University*, Ames, IA.

1996 **Russian Presidential Scholarship for Talented Young Researchers**, *Siberian Aerospace Academy*, Krasnoyarsk, Russia.

1995–1996 **The Gagarin's Award for Academic Excellence**, *Siberian Aerospace Academy*, Krasnoyarsk, Russia.

1995 **The National Competition in the Strength of Materials, 1st place**, *Siberian Aerospace Academy*, Krasnoyarsk, Russia.

1994 **SAA Competition in the Strength of Materials, 2nd place**, *Siberian Aerospace Academy*, Krasnoyarsk, Russia.

Memberships

- AIAA since 2000
- ASME since 2005

Reviewer

- Composites Science and Technology
- International Journal for Structural and Multidisciplinary Optimization
- Aerospace Science and Technology
- AIAA Structures, Structural Dynamics, and materials Conference (SDM)
- ASME International Design Engineering Technical Conference (IDETC)
- Journal of Materials Engineering and Performance
- Transactions on Mathematical Software

Courses Taught

- UTC Aerospace Systems (Instructor): Structural Optimization
- UTC Aerospace Systems (Instructor): Python for Stress Engineers
- Virginia Tech (TA): ESM2204: Mechanics of Deformable Bodies
- Virginia Tech (TA): ESM2214: Statics and Mechanics of Materials

Publications

Journal Articles and Reports (11)

[1] Yi M., Fadel G.M., and **Gantovnik V.B.** Vehicle configuration design with a packing GA. *International Journal of Heavy Vehicle Systems*, 15(2–4):423–447, 2008.

[2] Lopatin A.V., Rutkovskaya M.A., and **Gantovnik V.B.** Accuracy analysis of the reflective surface of the umbrella-type antenna. *Journal of Spacecraft and Rockets*, 45(1):149–151, 2007.

[3] Creehan K.D., **Gantovnik V.B.**, and A. Varadarajan. Direct rapid manufacturing of precious metals. *Center for High Performance Manufacturing Technical Report, September 15*, 2005.

[4] **Gantovnik V.B.**, Gürdal Z., Watson L.T., and Anderson-Cook C.M. A genetic algorithm for mixed integer nonlinear programming problems using separate constraint approximations. *AIAA Journal*, 43(8):1844–1849, 2005.

[5] **Gantovnik V.B.**, Anderson-Cook C.M., Gürdal Z., and Watson L.T. A genetic algorithm with memory for mixed discrete-continuous design optimization. *Computers & Structures*, 81:2003–2009, 2002.

[6] **Gantovnik V.B.**, Gürdal Z., Watson L.T., and Anderson-Cook C.M. A genetic algorithm for mixed integer nonlinear programming problems using separate constraint approximations. *Technical Report TR–03–22, Computer Science, Virginia Tech*, 2003.

[7] **Gantovnik V.B.**, Anderson-Cook C.M., Gürdal Z., and Watson L.T. A genetic algorithm with memory for mixed discrete-continuous design optimization. *Technical Report TR–03–12, Computer Science, Virginia Tech*, 2003.

[8] **Gantovnik V.B.**, Gürdal Z., and Watson L.T. A genetic algorithm with memory for optimal design of laminated sandwich composite panels. *Composite Structures*, 58(4):513–520, 2002.

[9] **Gantovnik V.B.**, Russell A.M., Chumbley L.S., Wongpreedee K., and Field D. Advances in deformation processed gold composites. *Gold Bulletin*, 33(4):128–133, 2000.

[10] Xu K., Russell A.M., Chumbley L.S., Laabs F.C., **Gantovnik V.B.**, and Tian Y. Characterization of strength and microstructure in deformation processed Al-Mg composites. *Journal of Materials Science*, 34(24):5955–5959, 1999.

[11] Russell A.M., Chumbley L.S., **Gantovnik V.B.**, Xu K., Tian Y., and Laabs F.C. Anomalously high impact fracture toughness in B.C.C. Mg-Li between 4.2K and 77K. *Scripta Materialia*, 39(12):1663–1667, 1998.

Conference Papers (17)

[12] **Gantovnik V.B.** and Gibas C. Modeling competitive kinetics of DNA hybridization reactions. In *Proceeding of the 13th Annual Institute of Biological Engineering (IBE) Conference, Chapel Hill, NC, March 6–9*, 2008.

[13] Lopatin A.V., Shumkova L.V., and **Gantovnik V.B.** Nonlinear deformation of an orthotropic membrane stretched on a stiffened frame of a solar cell. In *Proceeding of the 49th AIAA/ASME/ ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper No. 2008-2302, Schaumburg, IL, April 7–10*, 2008.

[14] **Gantovnik V.B.**, Lopatin A.V., and Shumkova L.V. Optimal design of sandwich beam with frequency constraints. In *Proceeding of the DETC-07, ASME 2007 Design Engineering Technical Conferences and Computers and Information in Engineering Conference, DETC2007-35597, Las Vegas, NV, September 4–7*, 2007.

[15] Rutkovskaya M.A., Lopatin A.V., and **Gantovnik V.B.** Optimal choice of design parameters of the thin-walled composite spoke of umbrella-type antenna. In *Proceeding of the 2007 International Symposium on Antennas and Propagation, Niigata, Japan, August 20–24*, 2007.

[16] Lopatin A.V., Rutkovskaya M.A., and **Gantovnik V.B.** Accuracy analysis of the reflective surface of the umbrella-type antenna. *Journal of Spacecraft and Rockets*, 45(1):149–151, 2007.

[17] Dong H., **Gantovnik V.B.**, and Fadel G.M. Packaging with shape morphing: Status. In *Proceeding of the 13th Annual Automotive Research Center (ARC) Conference, Ann Arbor, MI, May 15–16*, 2007.

[18] **Gantovnik V.B.**, Tiwari S., and Fadel G.M. Multi-objective optimization of heterogeneous non-uniform flywheel. In *Proceeding of the 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper No. 2007-2288, Honolulu, HI, April 23–26*, 2007.

[19] **Gantovnik V.B.**, Tiwari S., Fadel G.M., and Yi M. Multi-objective vehicle layout optimization. In *Proceeding of the 11th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, AIAA Paper No. 2002-5431, Portsmouth, VA, September 6–8*, 2006.

[20] Tiwari S., Fadel G.M., and **Gantovnik V.B.** A survey of various encoding schemes and associated placement algorithms applied to packing and layout problems. In *Proceeding of the DETC-06, ASME 2006 Design Engineering Technical Conferences and Computers and Information in Engineering Conference, DETC2006, Philadelphia, PA, September 10–13*, 2006.

[21] **Gantovnik V.B.**, Fadel G.M., and Gürdal Z. An improved genetic algorithm for the optimization of composite structures. In *Proceeding of the DETC-06, ASME 2006 Design Engineering Technical Conferences and Computers and Information in Engineering Conference, DETC2006-99423, Philadelphia, PA, September 10–13*, 2006.

[22] Dong H., Tiwari S., Wang M., **Gantovnik V.B.**, and Fadel G.M. Underhood/underbody layout design with shape morphing. In *Proceeding of the 12th Annual Automotive Research Center (ARC) Conference, Ann Arbor, MI, May 23–24*, 2006.

[23] **Gantovnik V.B.** and Lopatin A.V. Modelling of the sandwich beam with laminated facings and compressible orthotropic core. In *Proceeding of the 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper 2006-2167, Newport, RI, May 1–4*, 2006.

[24] **Gantovnik V.B.**, Gürdal Z., and Watson L.T. Linear Shepard interpolation for high dimensional piecewise smooth functions. In *Proceeding of the 10th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, AIAA Paper No. 2004–4486, Albany, NY, August 30–September 1*, 2004.

[25] **Gantovnik V.B.**, Anderson-Cook C.M., Gürdal Z., and Watson L.T. A genetic algorithm for mixed nonlinear programming problems using separate constraint approximations. In *Proceeding of the 44rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper 2003-1700, Norfolk, VA, April 7–10*, 2003.

[26] **Gantovnik V.B.**, Anderson-Cook C.M., Gürdal Z., and Watson L.T. A genetic algorithm with memory for mixed discrete-continuous design optimization. In *Proceeding of the 9th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, AIAA Paper 2002-5431, Atlanta, GA, September 4–6*, 2002.

[27] **Gantovnik V.B.**, Gürdal Z., and Watson L.T. A genetic algorithm with memory for optimal design of laminated sandwich composite panels. In *Proceeding of the 43rd*

AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper 2002-1221, Denver, CO, April 22-25, 2002.

[28] **Gantovnik V.B.**, Gürdal Z., and Watson L.T. Genetic algorithm with memory for optimal design of laminated sandwich composite panels. In *Proceeding of the 16th Annual Technical Conference, American Society for Composites, Blacksburg, VA, September 9–12*, 2001.