

# Vladimir Gantovnik

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## Education

- 2000–2005 **PhD, Engineering Science & Mechanics**, *Virginia Polytechnic Institute and State University*, 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 **MS, 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
- 1992–1992 **MS, Aerospace Engineering, *summa cum laude***, *Siberian Aerospace University*, Krasnoyarsk, Russia.  
Thesis: Bending of a sandwich composite toroidal shell stiffened by rings under external pressure. Advisor: Prof. Alexander V. Lopatin

## Experience

- 2011–current **Structural Engineer**, *LightSail Energy*, Oakland, CA.  
Project: Design of composite high-pressure vessels for compressed-air energy storage (CAES) system.
- 2007–2010 **Research 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. Funded by NIH.
- 2005–2007 **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). Funded by U.S. Army TACOM.
- 2004–2005 **Research Assistant**, *Virginia Tech, Center for High Performance Manufacturing*, Blacksburg, VA.  
Project: Direct Rapid Manufacturing of Precious Metals. Funded by ProMetal.
- 2000–2004 **Research Assistant**, *Virginia Tech, Department of Engineering Science & Mechanics*, Blacksburg, VA.  
Project: Optimization of composite structures by an improved genetic algorithm. Funded by AFOSR.
- 1998–2000 **Research Assistant**, *Ames National Laboratory, Metallurgy and Ceramics Division*, Ames, IA.  
Project: Deformation processed Au-Ag and Au-Pt composites.

- 1997–1998 **Research Assistant**, *Siberian Aerospace Academy, Department of Computer Modeling*, Krasnoyarsk, Russia.  
Project: Analysis and design of toroidal composite shell.
- 1995–1997 **Intern Mechanical Engineer**, *The Krasnoyarsk Machine-Building Plant, Research Composite Laboratory*, Krasnoyarsk, Russia.  
Project: Development of plasma surface coatings for advanced materials.

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## Skills

Programming	C++, Java, Perl, Python, Fortran, R, MySQL, L <sup>A</sup> T <sub>E</sub> X
Numerical	Mathematica, Matlab, Maple, VisualDOC, GA, NSGA-II
FEA	Ansys, Nastran, Abaqus, CosmosM, Comsol Multiphysics, Altair Hypermesh, HyperSizer
CAD	SolidWorks, Pro/E, Catia

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## Memberships

- AIAA since 2000
- ASME since 2005

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## Reviewer

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

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## Publications

### Under Review & In Press (3)

- [1] **Gantovnik V.B.** and Gibas C. A unifying kinetic model of competitive DNA hybridization. *Biophysical Journal*, 2011.
- [2] Lopatin A.V., Rutkovskaya M.A., and **Gantovnik V.B.** Model of deployable composite rim of large space antenna. *Journal of Aerospace Engineering*, 2011.
- [3] Lopatin A.V., Rutkovskaya M.A., and **Gantovnik V.B.** Analysis of interference of geometric and rigid parameters of a thin-walled composite spoke of a space umbrella-type antenna. *Journal of Aerospace Engineering*, 2011.

## Journal Articles and Reports (11)

- [4] 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.
- [5] 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.
- [6] 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*.
- [7] **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.
- [8] **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.
- [9] **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*.
- [10] **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*.
- [11] **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.
- [12] **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.
- [13] 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.
- [14] Russell A.M., Chumbley L.S., **Gantovnik V.B.**, Xu K., Tian Y., and Laabs F.C. Anomalous 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)

- [15] **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*.
- [16] 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*.
- [17] **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*.
- [18] 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*.

- [19] 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.
- [20] 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*.
- [21] **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*.
- [22] **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*.
- [23] 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*.
- [24] **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*.
- [25] 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*.
- [26] **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*.
- [27] **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*.
- [28] **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 44th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA Paper 2003-1700, Norfolk, VA, April 7–10, 2003*.
- [29] **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*.
- [30] **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*.
- [31] **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*.