Petru Aurelian SIMIONESCU PhD, PE

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(Last updated: September 21, 2024)

Education

PhD, Auburn University, Mechanical Engineering (major), Applied Mathematics (minor) – 2004.

Doctorate in Technical Sciences, University Politehnica of Bucharest – 1999.

BS, University Politehnica of Bucharest, Mechanical Engineering with an Automotive Engineering concentration – 1992.

Lipova Army Armor School, Romania 1986–1987 and 1996 (graduated as a sergeant, promoted second lieutenant in 1996).

Licensures and Certifications

Professional Engineer (PE), Texas Board of Professional Engineers. (2016 - Present).

Small Wind Turbine Testing, NREL (2010).

LMS Virtual Lab Motion, LMS International (2011).

ASME Student Leadership Seminar, ASME (2007).

Principles of Vibration & Acoustics Measurement and Analysis, Brüel & Kjær (2006).

Professional Employment

Associate Professor, Texas A&M University Corpus Christi (Aug. 2016 - present).

Assistant Professor, Texas A&M University Corpus Christi (Jan. 2010 – May 2016).

Assistant Professor, University of Alabama at Birmingham (Jun 2007 - Dec 2009).

Assistant Professor, University of Tulsa (Jan. 2005 - May 2007).

Graduate Student & Research/Teaching Assistant, Auburn University (Jan. 2003 - Dec 2004).

Visiting Scholar, Auburn University (Oct. 1999 – Dec. 2002).

Visiting Scholar, University of Newcastle, England (Feb. 1997 - Sept 1997).

Graduate Student & Research/Teaching Assistant, University Politehnica of Bucharest (Sept. 1996 – Aug. 1999)

Exchange Academic Visitor, Heriot Watt University, Scotland (Feb. 1995 - June 1995).

Adjunct Faculty, University Transilvania of Brasov, Romania (Mar. 1994 – Aug. 1996).

Design/Research Engineer, Tractor Proiect S.A. former ICSITT Institute Brasov, Romania (Sep. 1992 – Aug. 1996).

Professional Memberships

American Society of Mechanical Engineers (ASME)

International Federation for the Promotion of Mechanism and Machine Science (IFToMM)

International Association of Engineers (IAENG)

TEACHING

Teaching Experience (the classes taught at TAMUCC are shown in boldface)

Foundations of Engineering

Materials Science

Statics

Dynamics

Strengths of Materials

Kinematics and Dynamics of Machinery

Manufacturing Processes

Design of Machine Elements

Mechanical Systems Design

Instrumentation & Measurements

Introduction to Automotive Engineering

Senior Design Projects

Stability and Vibrations of Discrete Systems (graduate)

Prototyping Skills

milling, turning, welding, wood- and sheet-metal working

SCHOLARLY & CREATIVE ACTIVITIES

Google Scholar: https://scholar.google.com/citations?hl=en&user=ranxbZsAAAAJ&view_op=list_works&sortby=pubdate

Google Patents: https://patents.google.com/?inventor=Petru+Simionescu&sort=new

Research Gate: https://www.researchgate.net/profile/Petru-Simionescu

Books

Simionescu PA (2022) *An Introduction to Mechanical Systems Design*, (369 p) Kindle Direct Publishing

Simionescu PA (2022) *A Compendium or Mechanisms and Machines*, (450 p) Kindle Direct Publishing

Simionescu PA (2015). *Computer Aided Graphing and Simulation Tools for AutoCAD Users,* (632 p.), Chapman & Hall / CRC, Boca Raton, FL.

Journal Articles (the names of post-docs and students advised are shown **boldfaced**)

Lu H., Liu K., **Sun W.** and Simionescu P.A. (2024) "Precise soil coverage in potato planting through plastic film using real-time image recognition with YOLOv4-tiny", *Scientific Reports* 14 (1), 16817 www.nature.com/articles/s41598-024-67321-1

Pei L., **Sun W.**, Wang J. and Simionescu P.A. (2024) "Design and Experiment of a Film-Drilling Potato Seeder with Eccentric Coupling", *Agriculture*, 14(6):933. https://doi.org/10.3390/agriculture14060933

Li J., **Sun W.**, Wang H., Wang J., Simionescu PA. (2024) "An Integrated Potato-Planting Machine with Full-Film Mulching and Ridged Row Soil Covering", *Agriculture*, 14(6):860. https://doi.org/10.3390/agriculture14060860

Du J., **Sun W.**, Zhao M., Wang J. and Simionescu P.A. (2024) "Design and Experimental Results Obtained with an Astragalus Digger Prototype" *Agriculture*, 14(5):701. https://doi.org/10.3390/agriculture14050701

Kohl M., **Spriesterbach M.**, **Tosto S.D.** and Simionescu, P.A. (2023) "Design and execution of a shallow well with storage tank and pumping system for residential irrigation use", *International Journal of Student Project Reporting*, 2(1), 15 p. https://faculty.tamucc.edu/psimionescu/PDFs/IJSPR-2023.pdf

Wang J., **Sun W.**, Simionescu P.A. and Ju Y. (2023) "Optimization of the Fluted Force-Feed Seeder Meter with the Helical Roller Using the Discrete Element Method and Response Surface Analysis", *Agriculture*, 13(7), 16 p www.mdpi.com/2077-0472/13/7/1400

Ju Y, **Sun W.**, Zhao A., Wang H., Liu X., Zhang H., Li H. and Simionescu PA (2023) "Development and testing of a self-propelled machine for combined potato harvesting and residual plastic film retrieval". *Machines*, 11, 432 (invited paper) www.mdpi.com/2075-1702/11/4/432

Liu Q., **Sun W.**, Zhang H., Liu X., Li H. and Simionescu PA (2023) "Numerical simulation and experiment of the emergence of young potato sprouts through soil-covered plastic mulching", *Agronomy Journal*, 2023 https://acsess.onlinelibrary.wiley.com/doi/abs/10.1002/agj2.21355

Simionescu P.A. and Constans E. (2022). "A comprehensive punch-press project for an undergraduate course on mechanical systems design". *International Journal of Student Project Reporting,* 1(1), p.83-98. www.inderscienceonline.com/doi/abs/10.1504/IJSPR.2022.121676

Sun W., Zhang H. and Simionescu P.A. (2021) "Numerical optimization and experimental validation of a five-link mechanism, potato planter" *Proc. IMechE, Part C: Journal of Mechanical Engineering Science,* 235(23), p. 6883-6892 https://journals.sagepub.com/doi/abs/10.1177/09544062211004652

Simionescu P.A. (2021). "Simulation of Repetitive Mechanisms using Modular Kinematics". *International Journal of Mechanisms and Robotic Systems*, 5(1/2), p.143-167. www.inderscience.com/info/inarticle.php?artid=115136 and https://faculty.tamucc.edu/psimionescu/PDFs/IJMR-2021.pdf

Simionescu P.A. (2020) A collection of bivariate nonlinear optimisation test problems with graphical representations, *International J. of Mathematical Modelling and Numerical Optimisation*, 10(4), p.365 – 398. www.inderscience.com/info/inarticle.php?artid=110704 and https://faculty.tamucc.edu/psimionescu/PDFs/IJMMNO-2020.pdf

Simionescu P.A. (2020). "Parametric Studies for the Optimum Synthesis of Oscillating-Slide Actuators for Vertical Manipulation Applications", *Engineering Letters*, 28(2), 12p. www.engineeringletters.com/issues_v28/issue_2/EL_28_2_40.pdf

Neagoe M., Saulescu R., Jaliu C. and Simionescu P.A. (2020) A Generalized Approach to the Steady-State Efficiency Analysis of Torque-Adding Transmissions Used in Renewable Energy Systems, *Energies* 13(17), 18p. (invited paper) www.mdpi.com/1996-1073/13/17/4568

Sun W. and Simionescu P.A. (2020) "Parameter Analysis and Field Tests of a Double Crank Multi-Rod under Plastic-Film Hill-Drop Mechanism Potato Planter" *American Journal of Potato Research*, 97, p.256-264. https://link.springer.com/article/10.1007/s12230-020-09773-5

Simionescu P.A. (2019). "Kinematics of the RRR, RRT (Passive) and RRRR, RRRT (Active) Linkage-Mechanism Building Blocks with Applications and Reporting of New Findings". *ASME Journal of Mechanisms and Robotics,* 11(6), 10p. https://doi.org/10.1115/1.4044546

Simionescu P.A. (2018) "Optimum synthesis of oscillating slide actuators for mechatronic applications" *Journal of Computational Design and Engineering*, 5(2), p.215-231 www.sciencedirect.com/science/article/pii/S2288430017300519

Simionescu P.A. (2017). "A unified approach to the kinematic synthesis of five-link, four-link, and double-wishbone suspension mechanisms with rack and-pinion steering control". *Journal of Automobile Engineering*, 231(10), p.1374-1387. https://journals.sagepub.com/doi/10.1177/0954407016672775 and https://faculty.tamucc.edu/psimionescu/PDFs/IMechE-2016.pdf

Simionescu PA (2016) "Design of planar slider-rocker mechanisms for imposed limit positions, with transmission angle and uniform motion controls" *Mechanism and Machine Theory,* Vol. 97, p.85-99. https://www.sciencedirect.com/science/article/abs/pii/S0094114X15002426

Simionescu P.A. (2016). "A restatement of the optimum synthesis of function generators with planar four-bar and slider-crank mechanisms examples". *International Journal of Mechanisms and Robotic Systems,* 3(1), p.60-79. www.inderscience.com/info/inarticle.php?artid=77038

Simionescu P.A. (2015) "Kinematics of the eccentric RPRPR chain with applications to robotics, materials handling and manipulation" *International Journal of Mechanisms and Robotic Systems, 2*(3-4), p.314-340. www.inderscience.com/info/inarticle.php?artid=74109

Talpasanu I. and Simionescu P.A. (2012) "Kinematic analysis of epicyclic bevel gear trains with matroid method" *ASME Journal of Mechanical Design, 134*, 8 pages. https://doi.org/10.1115/1.4007144

Simionescu P.A. and Mehrubeoglu M. (2012) "New concepts on 2D data visualization with applications in engineering analysis and design" *ASME Journal of Computing and Information Science in Engineering*, 12(2): 024501, 10p. https://doi.org/10.1115/1.4006204

Simionescu P.A. (2011) “Some advancements to visualizing constrained functions and inequalities of two variables” *ASME Journal Computing and Information Science in Engineering,* 11(1): 014502, 7p. https://doi.org/10.1115/1.3570770

Simionescu PA, Talpasanu I. and Di Gregorio R. (2010) “Instant-center based force transmissivity and singularity analysis of planar linkages” *ASME Journal of Mechanisms and Robotics*, 2(2): 021011, 12 p. https://doi.org/10.1115/1.4001094

Simionescu PA and Talpasanu I. (2007) “Dynamic effect of the bump-steer in a wheeled tractor” *Mechanism and Machine Theory*, 42(10), 1352-1361

Talpasanu I., Yih T.C. and Simionescu PA (2006). “Application of Matroid Method in Kinematic Analysis of Parallel Axes Epicyclic Gear Trains” *ASME Journal of Mechanical Design, 128*, 1307-1314.

Simionescu PA, Beale D.G., Dozier G.V. (2006) “Teeth-Number Synthesis of a Multispeed Planetary Transmission using an Estimation of Distribution Algorithm” *ASME Journal of Mechanical Design, 128*, 108-115.

Simionescu PA and Beale DG (2004) “Visualization of hypersurfaces and multivariable (objective) functions by partial global optimization” *The Visual Computer*, 20(10), 665-681.

Raper RL., Simionescu PA, Kornecki TS, Price AJ and Reeves DW (2004) “Reducing Vibration While Maintaining Efficacy of Rollers to Terminate Cover Crops” *ASABE Journal of Applied Engineering in Agriculture, 20*, 581-584.

Simionescu PA (2003) Improved display methods of single-valued functions of two variables, ASME *Journal of Computing and Information Science in Engineering*, 3(2), 136-143.

Simionescu PA (2002) “Initial Estimates in the Design of Central-Lever Steering Linkages" *ASME Journal of Mechanical Design, 124*, 646-651.

Simionescu PA and Beale DG (2002) “Optimum Synthesis of the Four-Bar Function Generator in its Symmetric Embodiment: the Ackermann Steering Linkage” *Mechanism and Machine Theory, 37*, 1487-1504.

Simionescu PA and Smith MR (2001) “Four and Six-bar Function Cognates and Overconstrained Mechanisms," *Mechanism and Machine Theory, 36*, 913-924.

Simionescu PA, Tempea I and Loch N (2001) “Kinematic Analysis of a Two-Degree-of-Freedom Steering Mechanism Used in Rigid Axle Vehicles” *Proc IMechE, Journal of Automobile Engineering, 215*, 803-812.

Simionescu PA and Smith MR (2000) “Applications of Watt II Function Generation Cognates” *Mechanism and Machine Theory, 35*, 1535-1549.

Simionescu PA and Smith MR (2000) “Initial estimates in the design of rack-and -pinion steering linkages” *ASME Journal of Mechanical Design, 122*, 194-201.

Simionescu PA and Smith M.R. (2000) “Single Valued Functions Graphical Representations in Linkage Mechanisms Design" *Mechanism and Machine Theory, 35*, 1709-1726.

Simionescu PA, Smith MR and Tempea I (2000) “Synthesis and Analysis of the Two-loop Translational Input Steering Mechanism” *Mechanism and Machine Theory, 35*, 927-943.

Simionescu PA (1998) “A Unified Approach to the Assembly Condition of Epicyclic Gears” *ASME Journal of Mechanical Design, 120*, 448-452.

Conference Proceedings (the names of post-docs and students advised are shown in boldface)

Simionescu PA (2023) *Planar overconstrained mechanisms of the linkage and compliant type*, Proc. of the 16th IFToMM Congress, Tokyo, Japan, November 5 - 10, 2023 (**accepted**)

Simionescu PA and Norton R.L. (2023) *On the history of early automobile suspension systems*, Proc. of the 16th IFToMM Congress, Tokyo, Japan, November 5 - 10, 2023 (**accepted**)

Simionescu PA (2023) *A novel class of geared manipulators of the SCARA type*, Proc. of the 16th IFToMM Congress, Tokyo, Japan, November 5 - 10, 2023 (**accepted**)

Simionescu PA, Hoeltgebaum T and Martins D (2022) *On the Evolution of Automotive Steering Mechanisms*, USCToMM Symposium on Mechanical Systems and Robotics, Rapid City, South Dakota, *May 2022.* https://link.springer.com/chapter/10.1007/978-3-030-99826-4_16

Simionescu PA (2022) *A revisit of the planar four-bar linkage synthesis problem for two and three input-output positions*, USCToMM Symposium on Mechanical Systems and Robotics, Rapid City, South Dakota, May 2022. https://link.springer.com/chapter/10.1007/978-3-030-99826-4_16

Simionescu PA (2021) *Simulation of Scissor-Type Planar Deployable Mechanisms using MeKin2D Subroutines*, 5th IEEE/IFToMM International Conference on Reconfigurable Mechanisms and Robots ReMAR 2021, August 12-14, 2021, Toronto, Canada, 8 p. https://books.google.com/books?hl=en&lr=&id=_eRnEAAAQBAJ&oi=fnd&pg=PA359&dq=info:-CI0KD_GT6wJ:scholar.google.com&ots=zvZbTluECz&sig=TKxbETeqJ0UM31pLs9_q1ytv_sI

Simionescu, P.A. and Mendoza-Diaz, N.V. (2021) *Enhancing Computer Programming Skills to Engineering Students Using MeKin2D Modular Kinematics Subroutines*. Proc. 2021 ASEE Annual Conference & Exposition, Virtual Meting, July 26-29, Paper ID #33320, 11p https://peer.asee.org/enhancing-programming-skills-to-engineering-students-using-mekin2d-modular-kinematics-subroutines.pdf

Simionescu PA and Neagoe M. (2020) *Cam Profiles Generation as Follower Envelopes with MATLAB Programs*, USCToMM Symposium on Mechanical Systems and Robotics, Rapid City, South Dakota, May 2020, p.10-19 https://link.springer.com/chapter/10.1007%2F978-3-030-43929-3_3

Simionescu PA and **Ortega S.** (2020) Analysis and Synthesis of Planar Cam Mechanisms Using Working Model 2D, *USCToMM Symposium on Mechanical Systems and Robotics, Rapid City, South Dakota*, May 2020, p.10-19 https://link.springer.com/chapter/10.1007/978-3-030-43929-3_2

Simionescu PA, and **Wei S.** (2019) *Mechanisms Design Issues of a Student-Built Off-Road Utility Vehicle*, 15th IFToMM Congress, Krakow, Poland, June 30 -July 4, 2019 https://link.springer.com/chapter/10.1007/978-3-030-20131-9_360

Simionescu PA (2019) *New and Revised Mechanism Classifications: Proposal and Motivation*, Proc. of the 15th IFToMM Congress, Krakow, Poland, June 30 -July 4, 2019 https://link.springer.com/chapter/10.1007/978-3-030-20131-9_345

Simionescu PA, Golfari N. and Constans E.W. (2019) *Planar Motion Structures Modeling and Simulation with MeKin2D Subroutines*, 15th IFToMM Congress, Krakow, Poland, June 30 -July 4, 2019 https://link.springer.com/chapter/10.1007/978-3-030-20131-9_124

Simionescu PA (2019) Named Contributions to MMS: Bridging History and Terminology, 15th IFToMM Congress, Krakow, Poland, June 30 -July 4, 2019 (*Best Paper Award*). https://link.springer.com/chapter/10.1007/978-3-030-20131-9_113

Simionescu PA (2016) *A Cost-Effective Computerized Data Acquisition and Motor Current Signature Analysis Demonstrator for Industry and Academia,* ASME Design Engineering Technical Conferences

and Computers and Information in Engineering Conference, Charlotte: NC, August 2016, 9p. https://doi.org/10.1115/DETC2016-59085

Simionescu PA (2016) *MeKin2D: Suite for Planar Mechanism Kinematics*, ASME Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Charlotte, NC, August 2016, 10p. https://doi.org/10.1115/DETC2016-59086

Simionescu PA (2016). *Example of a High-Speed, Side-Impact, Car Crash Reconstruction Using a Planar Multibody Software*. Intl Congress of Automotive and Transport Engineering, Brasov, Romania, 8p. https://link.springer.com/chapter/10.1007/978-3-319-45447-4_91

Simionescu PA, Lumkes J. and Austin W. (2015). *Automobile Tractorization, American Concept Applicable to Eastern European Agriculture*. Intl Symposium ISB-INMA-TEH' 2015, Bucharest, Romania, 6p. http://faculty.tamucc.edu/psimionescu/PDFs/ISB-INMATEH.pdf

Georgescu A., Simionescu PA and Talpasanu I. (2014). *Design and prototyping of a cost-effective sun tracking system for photovoltaic panels*. ASME International Mechanical Engineering Congress & Exposition, Montreal, Canada, 8p. https://doi.org/10.1115/IMECE2014-37682

Simionescu PA, Mehrubeoglu M., Caruso, K. and Reuter G.R. (2011). *A Metal Casting Laboratory Exercise - Collaboration Between the Engineering and Art Department at Texas A&M University Corpus Christi*. ASEE Annual Conference, Vancouver, BC, Canada, 10p. https://peer.asee.org/a-metal-casting-laboratory-exercise-collaboration-between-the-engineering-and-art-departments-at-texas-a-m-university-corpus-christi.pdf

Simionescu PA (2008). *Interactive Involute Gear Analysis and Tooth Profile Generation using Working Model 2D*. Proc. of the ASEE Annual Conference & Exposition, Pittsburgh PA, 8p.

Simionescu PA, Daily J. S. and Shadley J.M. (2007). *Data Acquisition and Computer Simulation Integrated Experiment for an Undergraduate Machine Dynamics Laboratory,* Proc. of the ASEE Annual Conference & Exposition, Honolulu HI, 8p. (*Best Paper Award nomination*)

Simionescu PA, Dozier G.V. and Wainwright R.L. (2006). *A Two-Population Evolutionary Algorithm for Constrained Optimization Problems*. Proc. of the 2006 IEEE World Congress on Computational Intelligence, Vancouver, Canada, 8p.

Simionescu PA (2005). *A General Method of Kinematic Analysis of Parallel Axes Epicyclic Gear Trains Based on Graph-Cycle Matroid Theory*. Proc. of the 2005 ASME DETC/CIE Conference, Boston MA, 8p.

Simionescu PA, Beale D.G. and Dozier G.V. (2004). *Constrained Optimization Problem Solving Using Estimation of Distribution Algorithms*. Proc. of the 2004 IEEE World Congress on Evolutionary Computation, Portland OR, 8p.

Simionescu PA and Beale D.G. (2002). *New Concepts in Graphic Visualization of Objective Functions*. Proc. of the ASME DETC/CIE, Salt Lake City UT, 8p.

Beale D.G., Simionescu PA and Dyer, D. (2001). *Grading and Motivation of Student Teams Working on Industry Sponsored Mechanical Design Projects*. Proc. of the ASME IMECE, New York, 8p.

Simionescu PA and Beale D.G. (2001). *Software for Graphical Representation of Objective Functions*. Proc. of the Artificial Neural Networks in Engineering Conference, Nov. 2001, St. Louis MO, 6p.

Simionescu PA (2001). *Optimization of the Mold Orientation on an Investment Casting Centrifuge*. Proc. of the 2001 Artificial Neural Networks in Engineering Conference (ANNIE), Nov. 4-7, 2001, St. Louis MO, 8p.

Simionescu PA and Beale D.G. (2000). Optimum Synthesis of the Slider-rocker Planar Mechanism for Two Prescribed Positions. Proc. of the ASME DETC/CIE Conference, Montreal Canada, 8p.

Raper R.L., Simionescu PA and Kornecki, T.S. (2004). *Cover Crop Rollers: A New Component of Conservation Tillage Systems*. Proc. of the 2003 ASAE Annual International Meeting.

Simionescu PA (2003). *Improved Roller Technology for Cover Crop Management*. Proc. of the II Congresso Mundial sobre Agricultura Conservacionista.

Simionescu PA, Tempea I. and Smith M.R. (1999). *Kinematic and Kinetostatic Simulation of a Leg Mechanism*. Proc. of the 10th World Congress on the Theory of Machines and Mechanisms, Oulu, Finland, June 1999, 8p.

Simionescu PA and Fawcett J. N. (1997). *Static Equilibrium Determination of Multi DOF Systems*. Proc. of the 7th Symposium on Linkages and CAD Methods, Syrom'97, Bucharest, Romania, 8p.

Simionescu PA and Alexandru P. (1995). *Synthesis of Function Generators Using the Method of Increasing the Degree of Freedom of the Mechanism*. Proc. of the 9th World Congress on the Theory of Machines and Mechanisms, Milan, Italy, August 1995, 6p.

Presentations (the names of student collaborators are shown boldfaced)

Simionescu PA (2022) *Applications on Measurements and Instrumentation*, National Institute of Research and Development in Mechatronics & Measurement Techniques, Bucharest, June 2022.

Simionescu PA (2022) *Contributions to point, line, 2D surface and multidimensional (hypersurface) visualization*, Colorado School of Mines, May 2022.

Simionescu PA (2019) *Design Simulation Topics Relevant to Automotive Engineering*, Toyota Research Institute, Ann Arbor, Michigan, March 2019.

Simionescu PA (2015) *Innovations on One, Two and Multi-Dimensional Data Visualization*, Texas A&M University-Corpus Christi, CoSE Seminar, May 2015.

Robinson S., Mehrubeoglu M. and Simionescu PA (2013) *Comparative Analysis of Multiple Vision Systems for Metal Surface Defect Detection*, 12th Annual Undergraduate Research Symposium, College of Science and Engineering and South Texas Chapter of Sigma Xi, Harte Research Institute, Texas A&M University-Corpus Christi. (March 2, 2013).

Smith D., **Smith S.**, Mehrubeoglu M., Smee D.L. and Simionescu PA (2013) *Investigating Oyster Shell Thickness and Strength Using Three Imaging Modalities: Hyperspectral Imaging Thermal Imaging, and Digital Photography*, 12th Annual Undergraduate Research Symposium, College of Science and Engineering and South Texas Chapter of Sigma Xi, Harte Research Institute, Texas A&M University-Corpus Christi.

Simionescu PA (2012) *Renewable Energy Research at Texas A&M University Corpus Christi*, Romanian Diaspora in Scientific Research & Higher Education, Bucharest, Romania, Sept. 2012.

Intellectual Property

Granted and pending patents

Simionescu PA “Yarn Tensioning Device” US Patent 12,037,725

Simionescu PA “Hand-Actuated Earth Auger” US Patent 1,1840,892
https://patents.google.com/patent/US11840892B2

Simionescu PA “Geared parallel manipulator of the SCARA type” US Patent 11,820,010
https://patents.google.com/patent/US11820010B1

Simionescu PA “Restretchable Stencil Frame” US Patent 11,420,435
https://patents.google.com/patent/US11420435B1/en

Simionescu PA “Parallel mechanism masticator and chewing apparatus” US Patent 10,596,699
https://patents.google.com/patent/US10596699B2/en

Simionescu PA “Vertical Take-Off and Landing Unmanned Aerial vehicle VTOL-UAV” US Patent 10,583,924 https://patents.google.com/patent/US10583924B2/en

Raper R. and Simionescu PA “Smooth Rolling Cover Crop Roller”, US Patent 6,968,907
https://patents.google.com/patent/US6968907B1/en

Simionescu PA and Tempea I. “Steering System of a Four-Wheel Steer Vehicle”, Romanian Patent 114 582

Simionescu PA “Method and Arrangement for Diagnosis of the Steering and Suspension of a Front-Wheel-Drive Vehicle”, Romanian Patent 114 513

Simionescu PA “Mechanical Steering System for Reversible Driving Station”, Romanian Patent 114 314

Simionescu PA “Mechanical Steering System with Zero Bump Steer”, Romanian Patent 110 692

Simionescu PA “Transmission of a Walk-Behind Tractor”, Romanian Patent 110 135

Simionescu PA “Lubricating Device for a Worm Gear”, Romanian Patent 108 897

Invention Disclosures:

Simionescu PA, **Urdea GD**, **Bennet M.**, Neagoe M. **Curtis K.** and Saulescu R. “Self-regulating wind turbine”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on February 17, 2023 (invention number 6229TAMUCC23).

Simionescu PA “VTOL Unmanned Aerial Vehicle”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on March 14, 2017 (invention number 4689TAMUCC17).

Simionescu PA “Slewing Drive”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on September 21, 2016 (invention number 4360TAMUCC16).

Simionescu PA “Assembly robot”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on October 28, 2014 (invention number 4283TAMUCC15).

Simionescu PA “Modular utility vehicle and transmission thereof”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on May 8, 2014 (invention number 4167TAMUCC15).

Simionescu PA, Karayaka H., Um D., “Dual Rotor Wind Turbine”, Disclosure of Invention filed with TAMU Office of Technology Commercialization on April 21, 2011 (invention number 3403TAMUCC11).

Simionescu PA and Changchit C. “Credit or cash card fuel consumption monitoring system” Disclosure of Invention filed with TAMU Office of Technology Commercialization on February 15, 2010 (invention number 3078TAMUCC).

Software:

MeKin2D subroutines for planar mechanism simulation https://sourceforge.net/projects/mekin2d/ (3886 Sourceforge downloads)

D_2D & D_3D plotting programs https://sourceforge.net/projects/d2d-and-d3d/ (490 Sourceforge downloads)

Contracts, Grants, Sponsored Research (pending or funded) and Startup

Chen L. D. (PI) and Simionescu PA, Cid Montoya M. and Ning Luo (Co-PI), *NSF-IUCRC Phase I Texas A&M University-Corpus Christi: Center for Growing Ocean Energy Technologies and the Blue Economy (GO Blue)*, $600,000 (2024-2029)

Neagoe M. (PI) and Simionescu PA (Co-PI), *Travel Grant*, Sponsored by Transilvania University of Brasov to attend the 2023 Collegiate Wind Competition in Boulder Colorado, $8,400 (May 2023)

Simionescu PA (PI) 2023 Collegiate Wind Competition, Department of Energy, $3,750 (September 2022 – January 2023)

Simionescu PA (Co-PI) *Research on Computer Aided Design and Analysis of Machinery and Mechanisms,* Post-doctoral expenses of Wei Sun, Gansu Agricultural University, $45,000 (Dec 2018 – Nov 2019)

Simionescu PA (PI) *Numerical Generation of Conjugate Profiles for Gerotor Pumps*, Toyota Motor North America, $35,000 (Jun 2017 – May 2019)

Moury J. (PI), Naehr T., Simionescu PA, and Wetz M. (Co-PIs) *NSF - AGEPT: Collaborative Research: Advancing Interdisciplinary STEM Graduate Education in Energy and Sustainability Disciplines*, $146,000 (Sept 2013 – Aug 2014)

Simionescu PA (PI), Um, D. (Co-PI) *NASA Robotics Mining Competition*, NASA Minority Innovation Challenges Institute, $4,000 (Jan. 2014 - Jun 2014).

Simionescu PA (PI), Karayaka, B.K., Chen, L.D. (Co-PIs), *Curriculum and Laboratory Development on Condition Monitoring and Diagnosis with Application to Nuclear Power Generation*, Nuclear Regulatory Commission (NRC), $150,000 (Sept 2011 - Dec 2013).

Simionescu PA (PI), Um D., Mahdy, A.M. (Co-PI), *NASA Lunabotics Mining Competition*, NASA Minority Innovation Challenges Institute, $4,000 (Jan. 2013 - Jun 2013).

Simionescu PA (PI), Travel Grant to attend the *Diaspora in Scientific Research & Higher Education*, Bucharest, Romania, Romanian Government, $1,800 (Sep 2012).

Simionescu PA (PI), Mahdy, A.M., Um, D. (Co-PI), *NASA Lunabotics Mining Competition*, NASA Minority Innovation Challenges Institute, $4,000. (Sept 2011 - Jun 2012).

Simionescu PA (PI), *NPI Workforce Development Subcontract*, Texas Nuclear Power Institute, $28,000 (May 2011 - Jun 2012).

Nelsen, J. (PI), Karayaka, B.K., Simionescu PA, Chen, L.D., Um, D. (Co-PI), *Wind Turbine Installation on TAMUCC Campus*, Texas Distributed Renewable Energy Technology Program, $1,184,900 (Jan. 2011 - Dec 2011).

Simionescu PA (PI), Karayaka, B.K., Mehrubeoglu Ruby (Co-PIs), *Engineering Summer Program for High School Juniors and Seniors*, Texas Higher Education Coordination Board, $20,000 (May 2011 - Aug 2011).

Simionescu PA (PI), Karayaka B.K., Um, D. (Co-PIs), *Investigations into the Effectiveness of a Novel Dual-Rotor Wind Turbine Arrangement*, Texas Research Development Fund (TRDF), $39,000 (Sep 2010 - Aug 2011).

Simionescu PA (PI), *Engineering Summer Program for High School Juniors and Seniors*, Texas Higher Education Coordination Board (THECB), $18,000 (Jun 2010 - Aug 2010).

Simionescu PA (PI), Startup from TAMUCC College of Science and Engineering, $13,000 (January 2010 - Aug 2011).

Grant Proposals (not funded)

Simionescu PA (PI) *A program for enhancing computer programming abilities of under-represented students through mechanisms, robotics & optimization applications*, NSF CUE-T, $585,000 TAMUCC portion out of $2,000,000 shared with Auburn University, South Dakota School of Mines, Southern University and A&M College, and Texas A&M University (September 2022)

Hua Li (PI) (TAMUK); Simionescu PA and P. Rangel (TAMUCC); A. Fuentes (UTRGV), *Enhancement of Team Working Abilities, Engineering Innovation and Hands-On Skills through Intercollegiate Competitions*, USDA-NIFA, $1,000,000, (April 2019).

Simionescu PA (PI) with J. Baca (TAMUCC); Hua Li (TAMUK), J. Ocampo De Los Rios (St. Mary's Univ), A. Fuentes and G. Potter (UTRGV), C. Chang (Univ of Houston), *Enhancement of Team Working Abilities, Engineering Innovation and Hands-On Skills through Intercollegiate Competitions,* USDA-NIFA, $1,000,000, (April 2018).

Shah Alam et al. (TAMUK) with Simionescu PA (TAMUCC) *Variable Temperature, Weather Control, Multiaxial Testing System*, NSF-MRI, $1,300,000 (February 2018, resubmitted February 2019).

Simionescu PA (PI) *Development of wind turbine testing and certification capabilities for a subtropical maritime environment at Texas A&M University Corpus Christi*, NSF MRI Limited Submission Preproposal, $960,000, (Oct. 2018).

Simionescu PA (PI) *A cost effective technique for steering and suspension diagnosis of military vehicles,* US Army Contracting Command, $450,000, (Jan. 2017).

Simionescu PA (PI) *Design of multilink suspensions for military vehicles,* US Army Contracting Command, $400,000 (Jan. 2017).

Simionescu PA (PI) *Condition Monitoring and Diagnosis of Electric Machines using Current Signature Analysis, Rotor Slip Measurements and Acoustic Emission*, National Instruments Academic Research Grant Program, $50,000 (Sep. 2016).

Simionescu PA (PI), Mahdy, A.M. (Co-PI), *Research Towards Improving the Fuel Consumption Monitoring of Motor Vehicles*, Texas A&M System Area 41 Challenge Grant program, $20,000 (Jun 2015).

Simionescu PA (PI), Xu, H., Ersoy, I.B. (Co-PIs), *NASA Robotic Mining Competition*, NASA Minority Innovation Challenges Institute, $25,000. (Jan. 2015).

Simionescu PA (PI) *Research on Dual-Rotor Wind Turbines for Offshore Applications*, Texas Higher Education Coordinating Board, Norman Hackerman Advanced Research Program, $100,000 (Jan. 2014).

Simionescu PA (PI) *Lost Foam - Lost Wax Centrifugal Investment Casing Process*, Wal Mart U.S. Manufacturing Innovation Fund, $350,000 (Jul. 2014).

Lumkes J. (PI Purdue University) Simionescu PA (Co-PI), *US - Cameroon Partnership to Strengthen Education, Service-Learning and Employment Opportunities in Sustainable Transportation, Agricultural Mechanization, and Renewable Energy*, USDA-NIFA, $100,000 (May 2012)

Simionescu PA (PI) with Purdue University and universities from Romania, Bulgaria and Republic of Moldova, *Development of Affordable Farm Mechanization and Transportation Means for Smallholder Agriculture in the Developing World through Intercollegiate Competitions*, United States Agency for International Development (USAID), $100,000 (May 2011)

Simionescu PA (PI), Chen, L.D. (Co-PI), with Purdue University and Romanian partners, *BREAD Innovative Program to Increase the Affordability of Farm Mechanization and Transportation Means of Smallholder Agriculture in the Developing World*, NSF/Gates Foundation, $880,000 (Jun. 2010)

Um, D. (PI), Naehr, Thomas H., Karayaka, B.K., Mahdy, A.M., Simionescu PA (Co-PIs), *Teaching Underwater Vehicle Technology to Mechanical Engineering, Biology, Computer Science, and K-12 students*, NSF/DUE $247,319 (Oct 2010).

Um, D. (PI), Thiyagarajan, M., Karayaka, B.K., Simionescu PA (Co-PIs), CNS - CISE - Research Experiences for Undergraduates Sites, NSF-REU $328,665 (Sept. 2010).

Simionescu PA (PI), Eslamian, M., Karayaka, B.K. (Co-PIs), Dual Fueling of Internal Combustion Engines with Generator Gas and Natural Gas for Improved Efficiency and Reliability, Texas Research Development Fund, $25,000 (Sept. 2012)

Undergraduate Students Advised:

McKinley Bennett, Jerin Henderson, Curtis Kenalty, Yohance Machado and Cameron Welp, “Self-regulating wind turbine” Participants at the 2023 DoE Collegiate Wind Competition.

Miles Kohl and Marek Spriesterbach, “Emergency Well Drilling” Participants at the 2021 Cuban American Engineers Competition.

Juan Alcaraz “Design and analysis of linkage type mechanical transmissions” LSAMP undergraduate research student, 2020

Samuel Ortega “Cam profile generation with applications” LSAMP undergraduate research student, 2019

Samuel Guevara, Nohelia Jimenez Valenzuela and Spencer Swenson, participants in the 4th SIOMMS Student International Olympiad on Mechanism and Machine Science, in Lima, Peru (ranked 9 out of 13 international teams).

Laura Flores (Co-advised with Dr. Ruby Mehrubeoglu) “Comparison of Temporal Heat Gradients in Thermal Images of Galvanized Parts for Detecting Potential Surface Defects”, LSAMP undergraduate research student, 3rd place at the 2017 Pathways Symposium held at Tarleton State University.

Wesley Horadam, FNU Prayoga and Mohammad Ahmed Hasan “Dual rotor wind turbine performance assessment” (2016) – Participants at the 2016 Gulf Coast Undergraduate Research Symposium held at Rice University on 22 October, 2016.

Bryan Jaksik “Sun tracking and stationary PV panel comparison” – Participant at the 2015 Pathways Symposium held at TAMUCC.

Claudiu Cherciu “Mobile robot motion control” (Summer 2013)

Adam Ersepke “Dual rotor wind turbine design and installation” (2010 - 2011)

MS Students Advised:

Andrei G. Draghici “Studies towards the design and prototyping of a reconfigurable, multipurpose utility vehicle with modular transmission”, Dept. of Mechanical Engineering, University of Alabama at Birmingham, 2009 (currently with Medtronic, Hialeah, FL).

Peter Gioko “Mathematical Modelling of the Stress Distribution in a Pressurized Rotating Thick Wall Cylinder”, Dept. of Mechanical Engineering, University of Alabama at Birmingham, 2008 (currently with Birmingham Water Works, Birmingham, AL).

Vamsi K. Chennamsetty “A study on self-erecting structures with application to the elevation system of the advance cutting transport facility of The University of Tulsa” Dept. of Mechanical Engineering, The University of Tulsa, 2007 (currently with Caterpillar Inc. Peoria, IL)

Viswanath R. Muga Penchala “Redesign for cost reduction of permanent attach solder screen frame assemblies used in the manufacturing of printed circuit boards”, Dept. of Mechanical Engineering, The University of Tulsa, 2007 (currently with Govind Development, Corpus Christi, TX)

MS Students Co-Advised:

Roja Ramani Molupoju (proposed research subject) “Implementation and Parallelization of an Evolutionary Algorithm for Constrained Optimization Problems” Dept. of Computing Science, Texas A&M University Corpus Christi, 2011 (currently with Paf-Games Sport Casino, Helsinki, Finland)

Hui V. Tran (proposed research subject) “A Massively-Parallel Line-Simplification Algorithm Using an Associative Computing Model” Dept. of Computing Science, Texas A&M University Corpus Christi, 2011 (currently with Exxon Mobil, Houston, TX)

Elie Barakat “The Effect of hydraulic vibrations on initiation of buckling and axial force transfer for helically buckled pipes at simulated horizontal wellbore conditions” Dept. of Petroleum Engineering, University of Tulsa, 2006 (currently with Chevron Corporation, Midland, Texas).

Postdoctoral Researchers Advised:

Wei Sun (Dec. 2018 - Nov. 2019) - currently with Gansu Agricultural University, Lanzhou, PR China;

Adrian Georgescu (Jan. 2013 - Jan. 2015) - currently with Continental Corp., Sibiu, Romania

Cosmina Nicula (Aug. 2012 - Dec. 2013) - currently instructor at Texas A&M University Corpus Christi;

Senior Design Projects Advised:

Basic utility vehicle – electric generator electric water pumping system

Basic utility vehicle – engine upgrade and cargo bed

Basic utility vehicle – handlebars and implement for walk behind operation

Basic utility vehicle – powertrain and frame structure

Basic utility vehicle – steering control and water pumping system
Casting centrifuge
Dental material testing apparatus
Dual rotor wind turbine
Electric generator test stand
Residential shallow well with water storage system
Single motor VTOL-UAV
Slip ring for a wind turbine
Tethered quadcopter

Scholarly and Creative Awards and Honors:

Best Paper Award, International Federation for the Promotion of Mechanism and Machine Science (IFToMM) for paper *Named Contributions to MMS: Bridging History and Terminology*, July 4, 2019.

Best Paper Award Nomination, American Society for Engineering Education Conference, for paper *Data Acquisition and Computer Simulation Integrated Experiment for an Undergraduate Machine Dynamics Laboratory,* June, 2007.

Second Place, Undergraduate Student Research Competition - Robotics & Mechanisms Division, University Politehnica Bucharest, April 1991

Fifth place, Cuban American Engineers Competition, October 2020, (as faculty adviser)

Nineth Place, IFToMM Student International Olympiad on Mechanisms and Machine Science (SIOMMS), Lima, Peru, October 2018 (as faculty adviser).

Second Place, TAMUCC – IEEE Capstone Student Project, May 2018 (as faculty adviser).

Second Place, ASME Student Project Manufacturing Design Competition, Nov. 2001 (as faculty adviser).

SERVICE

University

Member, University Affordable Learning Tools Committee (2023 - present).
Member, College of Engineering and Computer Science Curriculum Committee (2023 - present).
Member, University Faculty Hearing Committee (2021 - 2023).
Member, University Environmental Council (2021 - 2023).
Member, University Student Misconduct Hearing Committee (2018 - 2021).
Member, College of Science and Engineering Research Enhancement Committee (2018 - 2020).
Member, College of Science and Engineering Curriculum Committee (2015 - 2017).
Member, University Senate (2017 - 2018).
Member, Engineering Undergraduate Laboratory Committee (2010 - 2012).
Faculty Adviser ASME Student Chapter (2013 - 2021).
Faculty Adviser SHPE Student Chapter (2014 - 2016).

Profession

Editor-In-Chief, International Journal of Student Project Reporting (2020 - present).

Editorial Board Member, International Journal of Mechanisms and Robotic Systems (2016 - present).

Guest Editor, Frontiers in Energy Research, Special issue “Advances in Modeling and Simulation of Wind and Solar Energy Systems for the Built Environment” (2022-2023)

Member of the Technical Committee on Transportation Machinery of the International Federation for the Promotion of Mechanism and Machine Science IFToMM (2018 - present).

Session Chair, 2022 USCToMM Symposium on Mechanical Systems and Robotics, May 19-21, 2022, Rapid City, South Dakota

Session Chair, 5th IEEE/IFToMM International Conference on Reconfigurable Mechanisms and Robots ReMAR 2021, Aug. 12-14, 2021, Toronto, Canada

Reviewer, Acta Polytechnica -Journal of Advanced Engineering
Reviewer, Agriculture
Reviewer, Algorithms
Reviewer, Applied Mathematical Modelling
Reviewer, ASME Journal of Computing and Information Science in Engineering
Reviewer, ASME Journal of Mechanical Design
Reviewer, ASME Journal of Mechanisms and Robotics
Reviewer, Encyclopedia
Reviewer, IMechE Journal of Automobile Engineering
Reviewer, International Journal of Vehicle Design
Reviewer, International Journal of Mechanisms and Robotic Systems
Reviewer, International Journal of Student Project reporting
Reviewer, Inverse Problems in Science & Engineering
Reviewer, Journal of Mechanical Science and Technology
Reviewer, Journal of the Brazilian Society of Mechanical Sciences and Engineering
Reviewer, Machines
Reviewer, Mechanical Systems and Signal Processing
Reviewer, Mechanism and Machine Theory
Reviewer, Strain
Reviewer, Symmetries

Reviewer textbook, Taylor & Francis / CRC Press. (January 2017).
Reviewer reference book, Taylor & Francis / CRC Press. (August 2014).
Reviewer reference book, Taylor & Francis / CRC Press. (January 2014).
Reviewer textbook, John Willey & Sons Inc. (May 2010).

Promotion external reviewer, University Transilvania of Brasov, Romania (June 2019).
Promotion external reviewer, Wentworth Institute of Technologies (May 2016).

Ph.D. Dissertation external reviewer, Technical University of Moldova. (March 2017).
Ph.D. Dissertation external reviewer, Technical University of Moldova. (January 2015).
Ph.D. Dissertation external reviewer, Technical University of Moldova. (June 2010).

Community

City of Corpus Christi, consultant for the Soapbox Derby Competition, October 2021.

Event Director, Regional Science Olympiad 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

Judge, First Tech Challenge 2013, 2014, 2015, 2016, 2017.

External Adviser, Collegiate High School Robotics Club, 2010, 2011.

Consulting

Toyota Motor North America, Ann Arbor, Michigan, 2017-2019

Vulcan Engineering, Birmingham, Alabama, 2008

Manufacturing Resource Corporation, Fremont California, 2006

Shark Euro-Pro, Auburn, Alabama, 2004

News & Media Appearances

TAMUCC News, Jun. 2023 A group of Islanders attended the Collegiate Wind Competition in Boulder, Colorado

TAMUCC News, Nov. 2018 Islander Engineering Trio Fares Well at International Olympiad in Peru

TAMUCC News, Mar. 2018 Islanders Create Competition

TAMUCC News, Nov. 2017 Islanders awarded at 14th Annual Pathways Research Symposium

TAMUCC News, May 2017 Islander engineering students build utility vehicle for Developing World

TAMUCC News, Nov. 2016 Student designed wind turbine

TAMUCC News, July 2015 Prototype sun tracking solar panel being tested for efficiency

CALLER TIMES, Mar. 2015 Professor publishes his first book