

Willem Jacobus Smit

House 52
Lynedoch Eco-Village
Stellenbosch
☎ 076 279 3661
☎ 021 808 4046
✉ willie.smit@gmail.com

Education

- 1998 **BEng (Mechanical)**, *University of Pretoria, Cum laude.*
- 2000 **MEng (Mechanical)**, *University of Pretoria, Cum laude.*
- 2008 **PhD (Electronic Engineering)**, *University of Pretoria.*

Master thesis

- Title *The optimal design of a planar Stewart platform for prescribed machining tasks*
- Supervisor Prof. J.A. Snyman

Doctoral thesis

- Title *Sparse coding for speech recognition*
- Supervisor Prof. E. Barnard

Experience

- 2004 **Part-time lecturer**, *University of Pretoria.*
Department of Mechanical Engineering
 - Lecturing the subject Electrotechnique
- 2005–2006 **Lecturer**, *Tshwane University of Technology.*
Technology Access Programme.
 - Lecturing the subjects Technical Drawing, Statics, Introduction to Engineering and Computer Literacy.
- 2007–2012 **Senior Lecturer**, *North-West University.*
Department of Mechanical and Nuclear Engineering.
 - Lecture the subjects Mechanical Design, Engineering Drawing and Philosophy of Science.
 - Act as Programme Coordinator for the Department.
 - Part of team that had to establish new programmes in the Faculty of Engineering.
- 2012–current **Senior Lecturer**, *Stellenbosch University.*
Department of Mechanical and Mechatronic Engineering.
 - Lecture the subjects Mechatronics, Modelling, Computer Programming and Advanced Control Systems.
 - Supervise postgraduate students.
 - Part of the Solar Thermal Energy Research Group (STERG).

Research fields

- Robotics and unmanned vehicles. The current focus is on obstacle avoidance for multicopters, since we believe this will be required by future regulations of autonomous vehicles.
- Teaching and learning. We are investigating how students prefer to learn and how technology can be used to enable efficient learning in very large classes.

Languages

- Afrikaans Home language.
English Highly proficient in spoken and written English.

Computer skills

- Operating systems Windows, Linux, Android
Tools MSOffice, LibreOffice, Mendeley, Eclipse, iSpring, Camtasia
Languages Matlab, C, C++, Java, Python, PHP, ActionScript, HTML

Publications

- [1] W. Agenbag, W. Smit, and T. Niesler, "Automatic segmentation and clustering of speech using sparse coding," in *PRASA, RobMech and AfLaT International Joint Symposium*, 2014.
- [2] J. Coetzee and W. Smit, "Simulation of an obstacle avoidance algorithm in a dynamic 2d environment," in *IMAV: International micro air vehicle competition and conference*, (Beijing, PR of China), pp. 256–263, 2016.
- [3] I. Ferreira and W. Smit, "Designing power line towers with circular hollow sections as members," in *SACAM 2014: South African Conference on Computational and Applied Mechanics*, 2015.
- [4] A. Grobler, P. Gauché, and W. Smit, "Gaussian mixture models as flux prediction method for central receivers," in *SOLARPACES: International Conference on Concentrating Solar Power and Chemical Energy Systems*, vol. 1734, p. 160007, AIP Publishing, 2016.
- [5] M. Le Roux, Q. Campbell, and W. Smit, "Large-scale design and testing of an improved fine coal dewatering system," *Journal of the Southern African Institute of Mining and Metallurgy*, vol. 112, no. 7, pp. 673–676, 2012.
- [6] J. Lock, W. Smit, and J. Treurnicht, "An investigation into multi-dimensional prediction models to estimate the pose error of a quadcopter in a csp plant setting," in *SOLARPACES: International Conference on Concentrating Solar Power and Chemical Energy Systems*, vol. 1734, p. 130012, AIP Publishing, 2016.
- [7] E. A. Niit and W. J. Smit, "Integration of model reference adaptive control (mrac) with px4 firmware for quadcopters," in *24th International Conference on*

Mechatronics and Machine Vision in Practice (M2VIP) Integration, (Auckland, New Zealand), 2017.

- [8] "Removing accelerometer redundancy in non-gyro inertial measurement unit," in *IEEE AFRICON: Science, Technology and Innovation for Africa, AFRICON 2017*, pp. 1447–1452, 2017.
- [9] W. Smit and J. Snyman, "The optimal design of a planar stewart platform for a prescribed task," in *SACAM 2000: International Conference on Applied Mechanics*, pp. 627–634, 2000.
- [10] W. Smit and E. Barnard, "Efficient coding leads to novel features for speech recognition," in *PRASA: Fifteenth Annual Symposium of the Pattern Recognition Association of South Africa*, p. 99, 2004.
- [11] W. Smit and E. Barnard, "Continuous speech recognition with sparse coding," *Computer Speech & Language*, vol. 23, no. 2, pp. 200–219, 2009.
- [12] W. Smit, "Sparse coding of single spoken digits," in *PRASA: Symposium of the Pattern Recognition Association of South Africa*, 2013.
- [13] J. Snyman and W. Smit, "The optimal design of a planar parallel platform for prescribed machining tasks," *Multibody System Dynamics*, vol. 8, no. 2, pp. 103–115, 2002.
- [14] M. Swanepoel, M. Booysen, and W. Smit, "A structural-locking bicycle docking mechanism to enable safe and convenient bicycle usage in urban environments," in *SACAM 2016: South African Conference on Computational and Applied Mechanics*, (Potchefstroom), 2016.
- [15] W. Van Niekerk, E. Mentz, and W. Smit, "Co-operative learning in thermodynamics: Solving problems in pairs," in *SASEE: Proceedings of the First Biennial Conference of the Society of the South African Society of Engineering Educators*, pp. 278–289, 2011.
- [16] R. van Breda and W. Smit, "Applicability of vector field histogram star (vfh*) on multicopters," in *IMAV: International micro air vehicle competition and conference*, (Beijing, PR of China), pp. 62–69, 2016.

Student supervision

- 9 Number of M.Eng students that have graduated
- 9 Number of M.Eng students currently enrolled
- 1 Number of PhD students currently enrolled