

# CURRICULUM VITAE

**Corné Coetzee**

**26 February 2018**

## PERSONAL DETAILS

**Surname:** Coetzee  
**Names:** Cornelius Jacobus (Corné)  
**Date of birth:** 15 July 1976  
**Nationality:** South African  
**ID Number:** 760715 515 8087  
**Languages:** Afrikaans and English  
**Address:** 5 Mareba Court  
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Stellenbosch  
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South Africa  
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## CURRENT POSITION

Associate Professor, Department of Mechanical & Mechatronic Engineering,  
Stellenbosch University

### Address

Department of Mechanical & Mechatronic Engineering  
Private Bag X1, 7602 Matieland, South Africa  
[www.mecheng.sun.ac.za](http://www.mecheng.sun.ac.za)

## ACADEMIC QUALIFICATIONS

- 2004:** PhD. (Mechanical Engineering), Stellenbosch University  
Thesis title: *The Modelling of Granular flow using the Particle-in-Cell Method*
- 2000:** MSc. Engineering (Mechanical), Cum Laude, Stellenbosch University  
Thesis title: *Forced Granular Flow*
- 1998:** B.Engineering (Mechanical), Cum Laude, Stellenbosch University
- 1994:** Secondary school education, High School De Villiers Graaff, Villiersdorp

## NRF RATING

Category C2 since December 2015

## ACADEMIC EXPERIENCE

**Stellenbosch University:** 01/07/2001 – 31/12/2001

Department of Mechanical Engineering

Part time lecturer Experimental Methods

**Stellenbosch University:** 01/01/2002 – 31/12/2002

Department of Mechanical Engineering

Part time lecturer Experimental Methods, Introduction to Machine Design

**Stellenbosch University:** 01/07/2003 – 31/12/2003

Department of Mechanical Engineering

Part time lecturer Introduction to Machine Design

**Stellenbosch University:** 01/07/2004 – 31/12/2004

Department of Mechanical Engineering

Part time lecturer Machine Design, Theory of Machines, Light Structures

**Stellenbosch University:** 02/01/2005 – 31/12/2016

Department of Mechanical & Mechatronic Engineering

Senior lecturer Engineering Drawing, Theory of Machines (Modelling)

**Stellenbosch University:** 01/01/2017 – current

Department of Mechanical & Mechatronic Engineering

Associate Professor Engineering Drawing, Theory of Machines (Modelling)

## OTHER EXPERIENCE

**Stellenbosch University:** 01/01/2004 – 30/06/2004

Department of Mechanical Engineering

Part time researcher at Van Reenen Steel: Dragline bucket modelling and optimisation

## PROFFESIONAL INTERESTS

Discrete Element Method (DEM) and related calibration methods, Material Point Method (MPM), meshless-finite element methods, polar continua (Cosserat), granular flow and bulk materials handling, numerical modelling of soil mechanics.

## PUBLICATIONS

### Refereed Journals

1. Coetzee, C.J., Vermeer, P.A., Basson, A.H., 2005, *The Modelling of Anchors using the Material Point Method*, International Journal for Numerical and Analytical Methods in Geomechanics, 29, 879-895
2. Coetzee, C.J., Basson, A.H., Vermeer, P.A., 2006, *Discrete and Continuum Modelling of Silo Discharge*, R&D Journal, A Publication of the South African Institution of Mechanical Engineering, 22(2), 26-38
3. Coetzee, C.J., Basson, A.H., Vermeer, P.A., 2007, *Discrete and Continuum Modelling of Excavator Bucket Filling*, Journal of Terramechanics, 44, 177-186
4. Coetzee, C.J., Els, D.N.J., 2009, *Calibration of Discrete Element Parameters and the Modelling of Silo Discharge and Bucket Filling*, Computers and Electronics in Agriculture, 65, 198-212
5. Coetzee, C.J., Els, D.N.J., 2009, *Calibration of Granular Material Parameters for DEM Modelling and Numerical Verification by Blade-Granular Material Interaction*, Journal of Terramechanics, 46, 15-26
6. Coetzee, C.J., Els, D.N.J., 2009, *The Numerical Modelling of Excavator Bucket Filling using DEM*, Journal of Terramechanics, 46, 217-227
7. Coetzee, C.J., Els, D.N.J., Dymond, G.F., 2010, *Discrete Element Parameter Calibration and the Modelling of Dragline Bucket Filling*, Journal of Terramechanics, 47, 33-44
8. Coetzee, C.J., Lombard, S.G., 2011, *Discrete Element Modelling of a Centrifugal Fertiliser Spreader*, Biosystems Engineering, 109, 308-325
9. Coetzee, C.J., Lombard, S.G., 2013, *The destemming of grapes: Experiments and Discrete Element Modelling*, Biosystems Engineering, 114, 232 – 248
10. Coetzee, C.J., Nel, R.G., 2014, *Calibration of discrete element properties and the modelling of packed rock beds*, Powder Technology, 264, 332-342
11. Coetzee, C.J., 2014, *Discrete and continuum modelling of soil cutting*, Computational Particle Mechanics Journal, 1(4), 409-423
12. Coetzee, C.J., Horn, E., 2014, *Calibration of the Discrete Element Method Using a Large Shear Box*, International Journal of Mechanical, Aerospace, Industrial and Mechatronics Engineering, 8(12), 2071-2080
13. Coetzee, C.J., Dobson, R.T., 2016, *A Simple Numerical Model for the Prediction of Apple Temperatures under Evaporative Cooling*, Research in Agriculture and Agronomy, 2016 (2016), 1- 14, Article ID 884279, DOI: 10.5171/2016.884279
14. Fadiji, T., Coetzee, C.J., Pathare, P., Opara, U.L., 2016, *Susceptibility to Impact Damage of Apples inside Ventilated Corrugated Paperboard Packages: Effects of Package Design*, Postharvest Biology and Technology, 111, 286-296
15. Fadiji, T., Coetzee, C.J., Chen, L., Chuckwu, O., Opara, U.L., 2016, *Susceptibility of apples to bruising inside ventilated corrugated paperboard packages during simulated transport damage*, Postharvest Biology and Technology, 118, 111-119
16. Coetzee, C.J., 2016, *Calibration of the Discrete Element Method and the Effect of Particle Shape*, Powder Technology, 297, 50-70
17. Fadiji, T., Coetzee, C., Opara, U.L., 2016, *Compression strength of ventilated corrugated paperboard packages: Numerical modelling, experimental validation and effects of vent geometric design*, Biosystems Engineering, 151, 231-247
18. Coetzee, C.J., 2017, *Review: Calibration of the discrete element method*, Powder Technology, 310, 104-142
19. Fadiji, T., Berry, T.M., Coetzee, C.J., Opara, U.L., 2017, *Investigating the mechanical properties of paperboard packaging material for handling fresh produce under different*

- environmental conditions: Experimental analysis and finite element modelling*, The Journal of Applied Packaging Research, 9(2), 20-34
20. Berry, T., Opara, U.L., Defraeye, T., Coetzee, C., Tsige, A., 2018, *Refining fresh produce packaging design to optimise refrigerated container usage and improve cooling efficiency*, Computers and Electronics in Agriculture, **submitted**
  21. Berry, T., Defraeye, T., Ambaw, A., Coetzee, C., Opara, U.L., 2018, *Factors Affecting Design and Performance of Ventilated Cartons in the Fresh Produce Cold Chain – A Review*, Journal of Food Engineering, **submitted**
  22. Fadiji, T., Berry, T., Opara, U.L., Coetzee, C., 2018, *Mechanical design and performance testing of corrugated paperboard packaging for postharvest handling of horticultural produce*, Biosystems Engineering, **Under review**
  23. Fadiji, T., Berry, T., Coetzee, C. J., Opara, L., 2018, *A review on the efficacy of finite element analysis (FEA) as a design tool in food packaging industries*, Biosystems Engineering, **Submitted**
  24. Scheffler, O.C., Coetzee, C.J., Opara, L., 2018, *Discrete element modelling of apple bruising*, Biosystems Engineering, **Under review**

### **International Symposia**

1. Els, D.N.J., Coetzee, C.J., 1999, *Friction Forces in a Vertically Pushed Granular Column*, International Symposium on Reliable Flow of Particulate Solids III, Porsgrunn, Norway
2. Coetzee, C.J., Els, D.N.J., 2002, *Modelling Excavator Bucket Filling with DEM*, Proceedings of the Fifth World Congress on Computational Mechanics (WCCM V), July 7-12, Vienna, Austria, Editors: Mang, H.A., Rammerstorfer, F.G., Eberhardsteiner, J., Publisher: Vienna University of Technology, Austria, ISBN 3-9501554-0-6, <http://wccm.tuwien.ac.at>
3. Beuth, L., Vermeer, P., Coetzee, C.J., Bonnier, P., van den Berg, P., 2007, *Formulations and Validation of a Quasi-Static Material-Point*, International Symposium on Numerical Models in Geomechanics, Rhodes, Greece, 25-27 April
4. Beuth, L., Benz, T., Vermeer, P., Wieckowski, Z., Coetzee, C.J., 2007, *Large deformation analyses using the Material-Point Method*, 17<sup>th</sup> International Conference on Computer Methods in Mechanics, CMM 2007, June 19 – 22, Lodz-Spala, Poland
5. Coetzee, C.J., 2009, *The Modelling of Bulk Materials Handling using the Discrete Element Method*, 1<sup>st</sup> African Conference on Computational Mechanics – An International Conference, AfriComp, January 7-11, Sun City, South Africa
6. Beuth, L., Więckowski, Z., Vermeer, P.A., Coetzee, C.J., 2009, *The Modelling of Large Deformation Geotechnics using the Material Point Method*, 1<sup>st</sup> African Conference on Computational Mechanics – An International Conference, AfriComp, January 7 – 11, Sun City, South Africa
7. Jassim, I., Coetzee, C.J., 2009, *A Contact Algorithm for Non-Structured MPM Meshes*, 18<sup>th</sup> International Conference on Computer Methods in Mechanics, CMM 2009, 18-21 May, Zielona Gora, Poland
8. Fadiji, T.S., Pathare, P.B., Opara, U.L., Coetzee, C.J., Chukwu, O., 2012, *Resistance of Apples to Mechanical Damage inside a Ventilated Corrugated Paperboard (VCP) Package*, 2<sup>nd</sup> International Conference on Post Harvest Technology & Quality Management, Post Harvest Africa, 25-29 November, Stellenbosch, South Africa
9. Nel, R.G., Louw, A.D.R., Coetzee, C.J., 2012, *A DEM-CFD approach to predict the pressure drop through an air-rockbed thermal storage system: Part 1*, First Southern African Solar Energy Conference, SASEC, 21-23 May, Protea Hotel Technopark, Stellenbosch, South Africa

10. Jassim, I., Coetzee, C.J., Vermeer, P., 2013, *A Dynamic Material Point Method for Geomechanics*, International conference: Installation effects in Geotechnical Engineering, GEO-INSTALL, Rotterdam, 24-27 March, ISBN: 978-1-138-00041-4
11. Coetzee, C.J., 2013, *Calibration of Material Properties for Discrete Element Modelling*, 3<sup>rd</sup> African Conference on Computational Mechanics - An International Conference, AfriComp, July 30-August 2, Livingstone, Zambia
12. Fadiji, T., Coetzee, C.J., Pathare, P., Opara, U.L., 2013, *Impact Damage of Apples inside Ventilated Cartons*, Post-harvest Innovation Programme Symposium, 19-20 November, Spier Estate, Stellenbosch, South Africa
13. Coetzee, C.J., Horn, E., 2014, *Calibration of the Discrete Element Method using a Large Shear Box*, International Conference on Materials, Structures and Mechanical Engineering, ICMSME, 30-31 December, Paris, France
14. Berry, T.M., Fadiji, T.S., Defraeye, T., Ambaw, A., Coetzee, C., Opara, U.L., 2016., *A multi-parameter approach to vent hole design for cartons packed with internal packaging*, Proceedings of the 8th International Postharvest Symposium: Enhancing Supply Chain and Consumer Benefits - Ethical and Technological Issues conference, 21-24 June 2016, Cartagena, Spain
15. Fadiji, T.S., Coetzee, C.J., Opara, U.L., 2016, *To protect and preserve – Studies to improve the mechanical design of ventilated fresh produce packaging*, 5th African Higher Education Week and RUFORUM Biennial Conference, 17–21 October, Cape Town, South Africa
16. Fadiji, T.S., Coetzee, C.J., Opara, U.L., 2016, *Modelling the structural behaviour of ventilated paperboard packaging*, Engineering and Technology Innovation for Global Food Security, 24–27 October, Cape Town, South Africa
17. Coetzee, C.J., 2016, *Calibration of the Discrete Element Method and the Effect of Particle Shape*, 10th South African Conference on Computational and Applied Mechanics, SACAM, 3-5 October 2016, Potchefstroom, South Africa
18. Fadiji, T., Berry, T., Ambaw, A., Coetzee, C., Opara, L., 2017, *Finite element analysis (FEA) - an effective and efficient design tool in food packaging industries: a review*, VII International Conference on Managing Quality in Chains (MQUIC2017), 4-7 September 2017, Stellenbosch, South Africa (full paper accepted for publication in Acta Horticulturae)
19. Fadiji, T., Berry, T., Ambaw, A., Coetzee, C., Opara, L., 2017, *Finite element modelling of the structural performance of ventilated paperboard packaging*, VII International Conference on Managing Quality in Chains (MQUIC2017), 4-7 September 2017, Stellenbosch, South Africa (full paper accepted for publication in Acta Horticulturae)
20. Berry, T.M., Defraeye, T., Ambaw, A., Coetzee, C., Opara, L., 2017, *Horticultural Packaging Systems of the Future: Improving Reefer Container Usage*, VII International Conference on Managing Quality in Chains (MQUIC2017), 4-7 September 2017, Stellenbosch, South Africa (full paper accepted for publication in Acta Horticulturae)

### **National Symposia**

1. Vogler, U., Coetzee, C.J., Vermeer, P.A., 2003, *Simulation of Field Model Tests by two different Numerical Approaches*. DGGK, AK 1.6 "Numerik in der Geotechnik": Workshop: Nachweise für Böschungen und Baugruben mit numerischen Methoden, S. 37-46, Weimar, Germany
2. Coetzee, C.J., 2008, *Calibration of Discrete Element Parameters and the Modelling of Bulk Materials Handling*, Conveyors and Bulk Materials Conference, 6-7 August, Midrand, South Africa

3. Berry, T.M., Coetzee, C., Opara, U.L., 2016. *Packaging – Functions and material*, Training presentation at the Postharvest short course for new farming entrants in cape flora, citrus, pome and stone fruit, pomegranates and table grapes, HortGro Science: Stellenbosch, South Africa, 17-18 August 2016.
4. Berry, T.M., Coetzee, C., Opara, U.L., 2017. *Packaging – Functions and material*, Training presentation at the 7th Postharvest Physiology and Technology Short Course of Fresh Horticultural Crops, HortGro Science: Stellenbosch, South Africa, 19-21 June 2017.
5. Coetzee, C.J., 2017, *Calibration of DEM parameters: Including applications*, Engineering Simulation Conference, Qfinsoft, Lord Charles, Somerset West, 29 August 2017
6. Coetzee, C.J., Wolff, K., 2017, *Blended Learning and Other Interventions used in First Year Engineering Drawing*, Scholarship of Teaching and Learning Conference (SoTL), Stellenbosch University, 24-25 October 2017

### **Popular Articles**

1. Coetzee, Corné, Hoe dors is jou dakrak?, WegRy 2012

### **H-INDEX**

h-index 10; total citations 374 (Scopus, 26 February 2018)

h-index 12; total citations 591 (Google Scholar, 26 February 2018)

### **PHD STUDENT SUPERVISION**

1. Tarl Berry, Optimisation of multi-scale ventilated package design for next-generation cold chain strategies of horticultural produce, March 2017  
Study Leader: Dr C.J. Coetzee & Prof L. Opara
2. Tobi Fadiji, Finite Element Modelling of ventilated fruit packaging, (expected to graduate March 2018)  
Study Leader: Dr C.J. Coetzee & Prof L. Opara
3. Otto Scheffler, Modelling of cohesive granular materials (expected to graduate December 2022)  
Study Leader: Dr C.J. Coetzee

### **MASTER STUDENT SUPERVISION**

1. Robert Nel, In-Situ Load Determination on Tower Structures, December 2005  
Study Leaders: Dr E. Terblanche & Dr C.J. Coetzee.
2. Graeme Dymond, Dragline bucket modelling using DEM, December 2007  
Study Leaders: Mr. D.N.J. Els & Dr C.J. Coetzee
3. Gerhard Lombard, Experimental and numerical investigation into the destemming of grapes, April 2011  
Study leader: Dr C.J. Coetzee
4. Etienne Horn, The calibration of material properties for use in Discrete Element Models, March 2012  
Study Leader: Dr C.J. Coetzee
5. Charel Wilke, Experimental measurement of graphite wear in helium at elevated temperatures and the Discrete Element Modelling of graphite dust production inside the pebble bed modular reactor, March 2013  
Study Leader: Dr C.J. Coetzee & Mr R. Dobson
6. Rick Nel, The Discrete Element Modelling of tunnels in thermal rock beds, March 2013

- Study Leader: Dr C.J. Coetzee
7. Tobi Fadji, Finite Element Modelling of ventilated fruit packaging, March 2015  
Study Leader: Dr C.J. Coetzee & Prof L. Opara
  8. Otto Scheffler, Discrete Element Modelling of Fruit Damage during Handling and Transport, March 2018  
Study Leader: Dr C.J. Coetzee & Prof L. Opara
  9. Stefan van Jaarsveld, Discrete Element Modelling of a planter (expect to graduate December 2016)  
Study Leader: Dr C.J. Coetzee
  10. Matthys du Toit, Discrete Element Modelling of Conveyor Transfer Points (expected to graduate December 2018)  
Study Leader: Dr C.J. Coetzee
  11. Megan Starke, Improvement of packaging for poimegranates (expected to graduate December 2019)  
Study Leader: Dr C.J. Coetzee & Prof L. Opara
  12. Juan van Santen, Improvement of agricultural implements (expected to graduate December 2019)  
Study Leader: Dr C.J. Coetzee

## GRANTS AWARDED

1. Stellenbosch University, Sub-Committee B, 2005 - 2009, Numerical modelling of granular materials, R30 000 per annum
2. NRF, THRIP, 2006 - 2008, Calibration of DEM parameters, R166 000
3. European Commission, FP7-PEOPLE-IAPP, 2010 - 2013, The development of Material Point Method Software, R400 000
4. NRF, Competitive Support for Unrated Researchers, CSUR, 2014-2016, Calibration of Discrete Element Parameters, R674 000
5. Stellenbosch University, Sub-Committee B, 2016, Equipment grant, R100 000
6. NRF, KIC travel grant, 2016, R25 000

## COMMITTEE

1. International Scientific Committee: 1<sup>st</sup> African Conference on Computational Mechanics, Africomp 2009, January 7 – 11, Sun City, South Africa
2. International Scientific Committee: 3<sup>rd</sup> African Conference on Computational Mechanics, Africomp, 30 July - 02 August 2013, Livingstone, Zambia
3. International Scientific Committee & Session Chair: International Conference: Installation Effects in Geotechnical Engineering, GEO-INSTALL, Rotterdam, 24-27 March 2013
4. Scientific Committee: 10th South African Conference on Computational and Applied Mechanics, SACAM, Potchefstroom, South Africa, 3-5 October 2016
5. Scientific Committee: 11th South African Conference on Computational and Applied Mechanics, SACAM, Vaal University of Technology, Vanderbijlpark, South Africa, 17-19 September 2018

## REVIEWER FOR JOURNALS

Regular reviewer for the following international journals:

1. Advanced Powder Technology
2. African Journal of Agricultural Research
3. Applied Physics A
4. Biosystems Engineering

5. Canadian Biosystems Engineering
6. Canadian Journal of Physics
7. Chemical Engineering Science
8. Computers and Electronics in Agriculture
9. Computers and Geotechnics
10. Computer Modeling in Engineering & Sciences
11. Engineering Computations
12. Engineering Geology
13. Geomechanics and Engineering
14. Granular Matter
15. Journal of Food Engineering
16. Journal of Mechanical Engineering Science
17. Journal of Terramechanics
18. Mathematical Geosciences
19. Powder Technology
20. Transactions of ASABE

### **AWARDS & RECOGNITIONS**

1. One of the eleven finalists for the European Society of Agricultural Engineering Outstanding Paper Award: best paper published in Biosystems Engineering Journal for the years 2010 and 2011 (Coetzee and Lombard, 2011).
2. Dean's medal for Upcoming Researcher of the year at the engineering faculty, December 2015.