

UNIVERSITY OF PRETORIA

CURRICULUM VITAE – Reinhard Joachim Huysen

November 2019

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION									
Surname	Huysen								
First names	Reinhard <u>Joachim</u>			ID Number	670424 5127 080				
Citizenship	South African			Title	Mr.	Female		Male	X
Place of birth	Pretoria, South Africa			Date of birth					
Population group	African		Coloured		Indian		White	X	Other (Please specify)
Department	Mechanical Engineering			Position		Lecturer			
Direct Telephone	012 420 2192			Direct Telefax					
E-mail	joachim.huysen@up.co.za								
Date of appointment	1 January 2014			Permanent full-time	X	Temporary full-time			
1.2 LANGUAGE PROFICIENCY <ul style="list-style-type: none"> • German (mother tongue): read, write, speak • English: read, write, speak • Afrikaans: read, write, speak 									
1.3 HIGHEST SCHOOL QUALIFICATION									
Diploma	Field of study			Higher education institution		Year	Distinctions		
Matric	Mathematics Physics Biology Geography German English Afrikaans			German School of Pretoria		1985			

1.4 ACADEMIC QUALIFICATIONS OBTAINED				
Degree	Field of study	Higher education institution	Year	Distinctions
BEng	Mechanical Engineering	University of Pretoria	1989	
MEng	Mechanical Engineering (Aeronautical)	University of Pretoria	1994	Cum Laude
1.5 ACADEMIC QUALIFICATIONS ENROLLED				
Degree	Field of study	Higher education institution	Period	
PhD	Aeronautical Engineering	University of Pretoria	2015-present	
1.6 WORK EXPERIENCE TO DATE				
Name of employer / Institution	Capacity and/or type of work			Period
University of Pretoria (UP)	Setting up composite materials workshop in the Department of Mechanical and Aeronautical Engineering (DMAE)			1990 – 1991
University of Pretoria	Lecturing flight mechanics (post graduate) in the DMAE Development of a computerized resin dispenser			1992 – 2002
University of Pretoria	Designing, constructing and testing of a full-scale test aircraft as researcher in the DMAE			1993 – 1996
Diomedes Innovations Pty (Ltd)	Founding Diomedes Innovations for prototype development, developing Wheely Stand, glider winch guillotine			1997
Diomedes Innovations Pty (Ltd)	Project manager and designer in the development of tooling and manufacturing techniques for composite materials as a THRIP industry partner to the UP			1998 – 2004
University of Pretoria	Senior lecturer for aerodynamics and fluid machines in the DMAE			1999 – 2000
Diomedes Innovations Pty (Ltd)	Development of a utility tricycle for the Department of Transport			2002 – 2003
Diomedes Innovations Pty (Ltd)	Development of a prototyping filament winder for composite materials			2004 – 2005
Diomedes Innovations Pty (Ltd)	Project manager and designer in an UAV and gas turbine development project as a THRIP industry partner to the UP with Denel Dynamics			2004 – 2006
Diomedes Innovations Pty (Ltd)	Development of a scale model research aircraft and design study for a full-scale sailplane			2007 – 2010
Diomedes Innovations Pty (Ltd)	Wind tunnel testing by particle imaging velocimetry at the University of Southern California			2010
Diomedes Innovations Pty (Ltd)	Development of a small high speed guided aircraft for Denel Dynamics			2010 – 2011
University of North West	Research on alternative aircraft configurations			2010 – 2013
University of Pretoria	Lecturer: machine design (MOW227 & 312), design projects (MOX410) and research projects (MRN) in the DMAE			2014 – present

2. TEACHING ACTIVITIES

2.1 Courses/modules presented: UNDERGRADUATE

Course	Level	Academic institution	Degree	Compilation of study guides	Curriculum design (Yes or No)
Aerodynamics	4 th year	UP	BEng	Yes	No
Fluid Machines	3 rd year	UP	BEng	Yes	No
Communication	3 rd year	UP	BEng	No	No
Research Projects	4 th year	UP	BEng	No	No
Design Projects	4 th year	UP	BEng	No	No
Machine Design	2 nd year	UP	BEng	No	No
Machine Design	3 rd year	UP	BEng	Yes	Yes

2.2 Other education and pedagogic courses presented

Course	Year	Institution
Flight Mechanics	Honours	UP

3. TEACHING OUTPUTS

3.1 Educational publications and products

4. OTHER TEACHING CONTRIBUTIONS

4.1 Membership of national and international bodies

4.2 Visits to local and overseas universities as guest professor or lecturer

4.2 Participation in national and international teaching associations, bodies, committees

5. RESEARCH ACTIVITIES

5.1 Former supervision or co-supervision (completed)				
Name of student	Degree/Title of dissertation/ thesis and date	Supervisor	Co-supervisor	Duration of studies (years)
S. W. vd M Meintjes	Comparative study into occupant support concepts with respect to crash response, 2004	Prof NJ Theron	RJ Huysen	4
D. S. Agenbag	Longitudinal Handling Characteristics of a Tailless Gull-Wing Aircraft, 2007	Prof NJ Theron	RJ Huysen	6
M. Kruger	Implementing a low fineness ratio fuselage in an airliner, 2016	Prof JP Meyer	RJ Huysen L Smith	2

5.2 Current post-graduate students					
Name of student	Degree enrolled for and date of first registration	Project title	Supervisor	Co-supervisor(s)	Year of registration
E. van Heerden	MEng	Lift and stability investigation on a low fineness ratio fuselage in an airliner	RJ Huysen		1st
P. Mutangwa	MEng	Investigation of the lateral stability properties of the tailless gull-wing configuration	RJ Huysen		1st

5.3 Obtaining research funds			
Origin of research funds	Title of research project	Duration	Money allocated (R) (Optional - exact amounts not required)
THRIP	A new concept aircraft	1997-2001	R2 370 000
THRIP	A prototype for tailless flight	2002-2005	R4 480 000
Airbus / NAC	Fuselage optimization for a new aircraft configuration	2014-2016	R 400 000

6. RESEARCH OUTPUTS

6.1 Publications in peer-reviewed or refereed journals

- R. J. Huyssen, G. R. Spedding, E. H. Mathews, L. Liebenberg; On the Wing Density and the Inflation Factor of Aircraft, *Aeronautical Journal*, manuscript AeroJ-D-13-04082R2, Vol. 120, Number 1224, February 2016.
- R. J. Huyssen, G. R. Spedding, E. H. Mathews, L. Liebenberg; Wing–Body Circulation Control by Means of a Fuselage Trailing Edge, *AIAA J. of Aircraft*, Vol. 49, No. 5, pp. 1279 – 1289, September-October 2012.
- D. S. Agenbag, N. J. Theron, R. J. Huyssen; Pitch Handling Qualities Investigation of the Tailless Gull-Wing Configuration, *AIAA J. of Aircraft*, Vol. 46, No. 2, pp. 683 – 691, March-April 2009.
- S. W. vd M Meintjes, R. J. Huyssen, N. J. Theron; Comparison of crash response with different occupant support concepts, *Aircraft Engineering & Aerospace Technology*, Vol. 76, Issue 4, pp. 366 – 375, 2004.
- R. J. Huyssen, C. P. Crosby, E. H. Mathews; The development of a high performance composite hang-glider, *Aeronautica Meridiana*, Vol 9, 1991.

6.2 Books and/or chapters in books

6.3 Published full-length conference papers/keynote addresses

6.4 Non-refereed publications or popular articles

- As invited guest speaker several public presentations on the development of a new aircraft configuration were given (also in Germany and the USA).
- There have been some broadcasts on local national television and in the USA on this work.

6.5 Patents

- Resin Dispenser, SA patent 1995 with UP as applicant
- Huyssen Flap, SA patent 1995 with UP as applicant
- Gull Configuration Patent, SA patent 2018 with UP as applicant
- The Gull-Configuration, Europe, USA, China, Canada, 2019 with UP as applicant

6.6 Technical reports

- Development of a utility tricycle, report for the Department of Transport, 2003
- Development of a 700N gas turbine, THRIP report 2006

- Development of a composite airframe for a turbine driven UAV, THRIP report, 2006
- Development of a parachute recovery system for a turbine driven UAV, THRIP report, 2006
- Development of a pneumatic UAV launcher, report for Denel Dynamics, 2006
- Development of electric ducted fan driven small guided aircraft, report for Denel Dynamics, 2011

7. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

7.1 Presentations at conferences

- R. J. Huysen, Testing the Natural Dominant Configuration for Aviation, AeSSA, RSA, 2019
- R. J. Huysen, About the Optimum Aircraft Configuration, AeSSA, RSA, 2018
- Koster JN, Buysse A, Smith L, Huysen RJ, Hotchkiss J, Malangoni J and Schneider J. AREND: A sensor aircraft to support wildlife rangers. 57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA SciTech, AAIA 2016-0827 San Diego 4 – 8 Jan, 2016. (*Technical Design Education Committee Award for best paper and presentation in Innovative design and education.*)
- M. Kruger, R. J. Huysen, L. Smith and J. P. Meyer, Application of a low fineness ratio fuselage to an airliner configuration. 54th AIAA Aerospace Sciences Meeting. AIAA 2016-1282 San Diego 4 – 8 Jan, 2016.
- Smith L, Huysen RJ, and Meyer JP. Investigation of a low drag body for an alternative wing-body-tail configuration, International Aerospace Society of South Africa. Stellenbosch, South Africa. 14 – 16 Sept 2015.
- Smith L, Huysen RJ, Buysse A and Koster JN. AREND – A Globally Designed Sensor UAS to Combat Wildlife Poaching, International Aerospace Society of South Africa. Stellenbosch, South Africa. 14 – 16 Sept 2015.
- R. J. Huysen, Downwash control by means of a fuselage trailing edge, IASSA, RSA, 2015.
- R. J. Huysen, A. Groenwold, On tailless flight: lessons learned from the Exulans, *Ostive Congress*, RSA, 2001.
- S. W. vd M Meintjes, R. J. Huysen, Development of a new concept for pilot protection, *Ostive Congress*, RSA, 2001.
- B. Barbieri, R. J. Huysen, A study of the longitudinal and lateral stability of the Exulans, *Ostive Congress*, RSA, 2001.
- R. J. Huysen, C. P. Crosby, The development of a high performance composite hang glider, *Ostive Congress*, New Zealand, 1995.
- R. J. Huysen, The resin dispenser, a new manufacturing process for composite materials, *Ostive Congress*, New Zealand, 1995.

7.2 Teamwork and collaboration with others

- As chief designer of an unmanned aerial system (aimed at combatting wildlife poaching) collaboration took place within a team at UP with a team at University of Colorado (USA), University of Stuttgart (Germany) and the University of Metropolia (Finland).

8. ARTISTIC OUTPUTS (*if applicable*)

9. MANAGEMENT AND ADMINISTRATIVE DUTIES

9.1 List your involvement in departmental activities

- Organizing the Mechanisms Competition of the design course
- Organizing and participating in industry visits
- Facilitating prototyping space and equipment

10. COMMUNITY SERVICE OR PROFESSIONAL SKILLS

10.1 Outreach projects

10.2 Professional service performed

10.3 Clinical service

10.4 Involvement with other universities/scientific institutions

- Prof. G. R. Spedding (University of Southern California)
- Prof. J. Koster (University of Colorado)
- Prof. E. H. Mathews (North West University)
- Prof. A. Groenwold (University of Stellenbosch)
- Mr. M. Morrelli (CSIR)
- Dr. E. Coetzee (Airbus, Future Projects Office, Bristol)

10.5 Referee duties

- External examiner for projects at NWU
- Technical evaluator for NRF

11. AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

11.1 Evaluation status as scientist/scholar

11.2 Research awards and prizes

- Gold Award in 'AVI Awards 2016' at the African Aviation Innovation Summit, sponsored by the Technology Innovation Agency
- "Best Paper Award" from the AIAA Design Engineering Technical Committee for the paper: "AREND: A Sensor Aircraft to support Wildlife Rangers" (AIAA 2016-0827)
- DTI award for 'Most innovative THRIP project 2002'
- Finalist in 'The Rolex Awards for Enterprise 1998'
- Winner of the NRF / SBDC 'Idea Competition 1997' (start-up funding for Diomedes Innovations)
- Aeronautical Society Award for 'best aeronautical final thesis 1989'
- University 3rd year student award 1988
- Gold medals at the 'Young Scientists Expo 1984'