UNIVERSITY OF PRETORIA

CURRICULUM VITAE – Reinhard Joachim Huyssen

February 2021

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION

Surname	Huyssen												
First names	Reinhard Joachim								**ID Number**		670424 5127 080		
Citizenship	South African								**Title**	Dr.	**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.huyssen@up.co.za												
Date of appointment	1 January 2014								**Permanent full-time**	X	**Temporary full-time**		

1.2 LANGUAGE PROFICIENCY

- 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	Comment
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	Comment
BEng	Mechanical Engineering	University of Pretoria	1989	
MEng	Mechanical Engineering (Aeronautical)	University of Pretoria	1994	Cum Laude
PhD	Aeronautical Engineering	University of Pretoria	2021	

1.5 ACADEMIC QUALIFICATIONS ENROLLED

Degree	Field of study	Higher education institution	Period	Comment

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 (postgraduate) in the DMAE Development of a computerized resin dispenser	1992 – 2002
University of Pretoria	Designing, constructing, and testing a full-scale test aircraft as a 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 a 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 (MOW 312 & 227), design projects (MOX410) and research projects (MRN) in the DMAE	2014 – present

TEACHING ACTIVITIES

2.1 Courses/modules presented: UNDERGRADUATE

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

2.2 Other education and pedagogic courses presented

Course	Year	Institution
Flight Mechanics	Honours	UP

2. TEACHING OUTPUTS

3. OTHER PARTICIPATIONS

4.1 Membership of national and international bodies

Member of Aeronautical Society of South Africa (AeSSA)

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)*
SW vd M Meintjes	Comparative study into occupant support concepts with respect to crash response, 2004	Prof NJ Theron	RJ Huyssen	4
DS Agenbag	Longitudinal Handling Characteristics of a Tailless Gull-Wing Aircraft, 2007	Prof NJ Theron	RJ Huyssen	6
M Kruger	Implementing a low fineness ratio fuselage in an airliner, 2016	Prof JP Meyer	RJ Huyssen 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 Huyssen		4st
J Templeton	MEng	Development of a periodic continuous combustion chamber for hydrogen	Prof J Dirker	RJ Huyssen	2st
G Lloyd	MEng	Investigating the lift distribution on the gull-wing configuration	Prof Craig	RJ Huyssen	2st

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 Non-refereed publications or popular articles

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

6.3 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

6.4 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 fan-driven small guided aircraft, report for Denel Dynamics, 2011

7. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

7.1 Presentations at conferences

- R. J. Huyssen, Testing the Natural Dominant Configuration for Aviation, *AeSSA*, RSA, 2019
- R. J. Huyssen, About the Optimum Aircraft Configuration, *AeSSA*, RSA, 2018
- Koster JN, Buysse A, Smith L, Huyssen 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. Huyssen, 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, Huyssen 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, Huyssen 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. Huyssen, Downwash control by means of a fuselage trailing edge, *IASSA*, RSA, 2015.
- R. J. Huyssen, A. Groenwold, On tailless flight: lessons learned from the Exulans, *Ostive Congress*, RSA, 2001.
- S. W. vd M Meintjes, R. J. Huyssen, Development of a new concept for pilot protection, *Ostive Congress*, RSA, 2001.
- B. Barbieri, R. J. Huyssen, A study of the longitudinal and lateral stability of the Exulans, *Ostive Congress*, RSA, 2001.
- R. J. Huyssen, C. P. Crosby, The development of a high-performance composite hang glider, *Ostive Congress*, New Zeeland, 1995.
- R. J. Huyssen, The resin dispenser, a new manufacturing process for composite materials, *Ostive Congress*, New Zeeland, 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 the University of Colorado (USA), University of Stuttgart (Germany), and the University of Metropolia (Finland).

8. MANAGEMENT AND ADMINISTRATIVE DUTIES

8.1 Involvement in departmental activities

- Managing final year flight competition
- Organizing the Mechanisms Competition of the design course
- Organizing and participating in industry visits
- Facilitating prototyping facility and test equipment

9. NETWORKING AND OTHER SERVICE

9.1 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)

9.2 Referee duties

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

10. AWARDS

10.1 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 year thesis 1989’
- University 3rd year student award 1988
- Gold medals at the ‘Young Scientists Expo 1984’