

**UNIVERSITY OF PRETORIA**  
**CURRICULUM VITAE: STEPHAN SCHMIDT**

**EVALUATION DATE:** *(Office use only)*

**1. BIOGRAPHICAL SKETCH**

**1.1 GENERAL INFORMATION**

<b>Surname</b>	Schmidt									
<b>First names</b>	Stephan				<b>ID Number</b>					
<b>Citizenship</b>	South African				<b>Title</b>	Dr	<b>Female</b>	<input type="checkbox"/>	<b>Male</b>	<input checked="" type="checkbox"/>
<b>Place of birth</b>	Pretoria, South Africa				<b>Date of birth</b>					
<b>Population group</b>	<b>African</b>	<input type="checkbox"/>	<b>Coloured</b>	<input type="checkbox"/>	<b>Indian</b>	<input type="checkbox"/>	<b>White</b>	<input checked="" type="checkbox"/>	<b>Other (Please specify)</b>	
<b>Department</b>	Mechanical and Aeronautical Engineering				<b>Position</b>		Senior Lecturer			
<b>Direct Telephone</b>	+27 (0) 12 420 2781				<b>Direct Telefax</b>					
<b>E-mail</b>	<a href="mailto:stephan.schmidt@up.ac.za">stephan.schmidt@up.ac.za</a>									
<b>Date of appointment</b>	1 April 2019				<b>Permanent full-time</b>	<input checked="" type="checkbox"/>	<b>Temporary full-time</b>	<input type="checkbox"/>		

**1.2 ACADEMIC QUALIFICATIONS OBTAINED**

Degree/ Diploma	Field of study	Higher education institution	Year	Distinctions
PhD	Mechanical Engineering	University of Pretoria	2019	N/A
MEng	Mechanical Engineering	University of Pretoria	2017	Cum Laude
BEng (Honours)	Mechanical Engineering	University of Pretoria	2015	Cum Laude
BEng	Mechanical Engineering	University of Pretoria	2014	Cum Laude

<b>1.3 WORK EXPERIENCE TO DATE</b>		
<b>Name of employer</b>	<b>Capacity and/or type of work</b>	<b>Period From mm//yy to mm//yy</b>
Invoke Analytics	Data Scientist	October 2018 – January 2019
C-AIM consult, Business Enterprises, University of Pretoria	Contractor	February 2019 – March 2019
University of Pretoria	Postdoctoral research fellow	February 2019 – March 2019
University of Pretoria	Senior Lecturer	April 2019 - present

## 2. TEACHING ACTIVITIES

<b>2.1 Courses presented</b>		
<b>Course</b>	<b>Level (e.g. second year, Masters)</b>	<b>Self developed (Yes or No)</b>
MEV781 (Vibration-based condition monitoring)	BEng (Honours) (Post-graduate)	No
MOO780 (Optimum Design)	BEng (Honours) (Post-graduate)	No

<b>2.2 Other education and pedagogic courses presented</b>		
<b>Course</b>	<b>Year</b>	<b>Institution</b>

### 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 in regard to teaching

#### 4.3 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(s)	Duration of studies (years)

#### 5.2 Current post-graduate students

Name of student	Degree enrolled for and date of first registration	Short project title	Supervisor	Co-supervisor(s)	Year of registration
Niehaus W. N.	MEng, 2019	Bearing condition monitoring	Prof PS Heyns	Dr S Schmidt	2019

#### 5.3 Obtaining research funds (*Optional*)

Origin of research funds (e.g. contract research, THRIP, international funding organisations, other(s))	Title of research project or programme	Duration	Money allocated (R) ( <i>Optional - exact amounts not required</i> )

## 6 RESEARCH OUTPUTS

### 6.1 Publications in peer-reviewed or refereed journals

Provide full details of each publication, including full titles, names of all the authors, journals, dates, page numbers etc.

#### Publications published in peer-reviewed or refereed journals

1. Schmidt, S., Heyns, P.S. and De Villiers, J.P., 2018. A novelty detection diagnostic methodology for gearboxes operating under fluctuating operating conditions using probabilistic techniques. *Mechanical Systems and Signal Processing*, 100, pp.152-166. (Impact factor: 4.370)
2. Schmidt, S., Heyns, P.S. and De Villiers, J.P., 2018. A tacholess order tracking methodology based on a probabilistic approach to incorporate angular acceleration information into the maxima tracking process. *Mechanical Systems and Signal Processing*, 100, pp.630-646 (Impact factor: 4.370).
3. Schmidt, S., Heyns, P.S. and Gryllias, K.C., 2019. A discrepancy analysis methodology for rolling element bearing diagnostics under variable speed conditions. *Mechanical Systems and Signal Processing*, 116, pp.40-61. (Impact factor: 4.370)
4. Schmidt, S., Heyns, P.S., 2019, An open set recognition methodology utilising discrepancy analysis for gear diagnostics under varying operating conditions. *Mechanical Systems and Signal Processing*, 119, pp.1-22. (Impact factor: 4.370)
5. Schmidt, S., Heyns, P.S., 2019, Localised gear anomaly detection without historical data for reference density estimation. *Mechanical Systems and Signal Processing*, 121, pp.615-635. (Impact factor: 4.370)
6. Schmidt, S., Heyns, P.S. and Gryllias, K.C., 2019, A pre-processing methodology to enhance novel information for rotating machine diagnostics. *Mechanical Systems and Signal Processing*, 124, pp.541-561. (Impact factor: 4.370)
7. Schmidt, S. and Heyns, P.S., 2020. Normalisation of the amplitude modulation caused by time-varying operating conditions for condition monitoring. *Measurement*, p.106964. (Impact factor: 2.791)
8. Schmidt, S., Heyns, P.S. and Gryllias, K.C., 2020, A methodology using the spectral coherence and healthy historical data to perform gearbox fault diagnosis under varying operating conditions. *Applied Acoustics*, 158, p.107038. (Impact factor: 2.297)

#### Publications submitted to peer-reviewed or refereed journals

1. Schmidt, S., Mauricio, A., Heyns, P.S., and Gryllias, K.C., A methodology for identifying information rich frequency bands for diagnostics of mechanical components-of-interest under time-varying operating conditions. Under review at *Mechanical Systems and Signal Processing*.
2. Schmidt, S., Zimroz, R., Chaari, F., Heyns, P.S., and Haddar M., The synchronous median of the squared envelope of the angle domain signal for gearbox diagnostics under time-varying operating conditions. Under review at *Mechanical Systems and Signal Processing*.
3. Schmidt, S, and Gryllias, K.C., The anomaly-based envelope spectrum for rotating machine fault diagnosis. Submitted to *Mechanical Systems and Signal Processing*.
4. Schmidt, S., Heyns, P.S. and Gryllias, K.C., Informative frequency band identification methods for gearbox fault diagnosis under time-varying operating conditions. Submitted to *Journal of Sound and Vibration*

--

<b>6.2 Books and/or chapters in books</b> Provide full details, including full titles, names of all the authors, publishers, dates, page numbers etc. Specify your exact contribution to the book e.g. editorial role, co-author
---

<b>6.3 Published full-length conference papers/keynote addresses</b> Provide full details of each publication, including full titles, names of all the authors, journals, dates, page numbers etc. <ol style="list-style-type: none"><li>Schmidt, S., Heyns, P.S. and De Villiers, J.P., Discrepancy signal processing techniques for gearbox condition monitoring applications, First World Congress on Condition Monitoring, London, United Kingdom, 13-16 June, 2017.</li><li>Schmidt, S., Heyns, P.S. and Gryllias, K.C., A probabilistic novelty detection methodology based on the order-frequency spectral coherence, The sixth International Conference on Condition Monitoring of Machinery in Non-Stationary Operations, Santander, Spain, 20-22 June, 2018. Nominated for the best paper in the category: Young researcher.</li><li>Schmidt, S., Heyns, P.S. and Gryllias, K.C., Discrepancy analysis for gearbox condition monitoring: A comparison of different healthy data models, The 31st International Congress and Exhibition on Condition Monitoring and Diagnostic Engineering Management, Sun City, South Africa, 2-5 July, 2018.</li><li>Schmidt, S., Heyns, P.S. and Gryllias, K.C., A comparison of different features for discrepancy analysis-based bearing diagnostics, The 28th Biennial ISMA conference on Noise and Vibration Engineering, Leuven, Belgium, 17-19 September, 2018.</li><li>Schmidt, S., Mauricio, A, Heyns, P.S. and Gryllias, K.C., A new method for identifying diagnostic rich frequency bands under varying operating conditions, SURVISHNO, Lyon, France, 8-10 July, 2019.</li></ol> <p>Conference papers accepted:</p> <ol style="list-style-type: none"><li>Schmidt, S., Heyns, P.S., Gryllias, K.C., Combining the spectral coherence with informative frequency band features for condition monitoring under time-varying operating conditions, COMADEM 2020.</li></ol>
---

<b>6.4 Non-refereed publications or popular articles</b>
--

<b>6.5 Patents</b>
--------------------

<b>6.6 Technical reports</b>
------------------------------

## 7 OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

<b>7.1 Participation in conferences, workshops and short courses - specify type of contribution</b> 7.2.1 National <ol style="list-style-type: none"><li>2017 Eskom Power Plant Engineering Institute Student Workshop (EPPEI); Attended, authored and presented one paper.</li></ol>
---

<b>2</b>	2017 Eskom Power Plant Engineering Institute Student Workshop (EPPEI); Attended, authored and presented one paper.
<b>7.2.2 International</b>	
<b>1</b>	First World Congress on Condition Monitoring (WCCM2017), London, England, June 13-16, 2017. Attended, authored and presented one paper.
<b>2</b>	The Sixth International Conference on Condition Monitoring of Machinery in Non-Stationary Operations (CMMNO2017), Santander, Spain, June 20-22, 2018. Attended, authored and presented one paper.
<b>3</b>	The 31st International Congress and Exhibition on Condition Monitoring and Diagnostic Engineering Management (COMADEM2018), Sun City, South Africa, 2-5 July, 2018. Attended, authored and presented one paper. Reviewer for three papers.
<b>4</b>	28th Biennial ISMA conference on Noise and Vibration Engineering (ISMA2018), Leuven, Belgium, 17-19 September, 2018. Attended, authored and presented one paper.
<b>5</b>	SURVISHNO: First joint organization of the conferences Surveillance, VISHNO (Vibration Shocks and Noise) and EVA (Experimental Vibration Analysis, Lyon, France, 8-10 July, 2019. Attended, authored and presented one paper.

<b>7.2</b>	<b>Teamwork and collaboration with others:</b>
	<i>Other researchers (national and international)</i>
	<ul style="list-style-type: none"> <li>• Prof Konstantinos Gryllias – KU Leuven, Belgium (2017 – Present)</li> <li>• Prof Fakher Chaari - University of Sfax, Tunisia (2019 - Present)</li> <li>• Prof Radoslaw Zimroz - Wroclaw University of Technology, Poland (2019 - Present)</li> </ul>
	<i>Other research institutions (national and international)</i>
	<i>Industry</i>

<b>7.3</b>	<b>Membership in national and international bodies</b>
------------	--

<b>7.4</b>	<b>Visits to local and overseas universities or research institutes as guest professor or researcher</b>
	2018: Visiting scholar at KU Leuven, hosted by Professor Konstantinos C Gryllias (2 weeks)
	2019: Visiting scholar at École nationale d'ingénieurs de Sfax, hosted by Professor Fakher Chaari (1 week)
	2019: Visiting scholar at KU Leuven, hosted by Professor Konstantinos C Gryllias (5 weeks)
	2019: Visiting scholar at INSA Lyon, hosted by Professor Jerome Antoni and Professor Quentin Leclere (4 weeks)

<b>8</b>	<b>ARTISTIC OUTPUTS (if applicable)</b>
----------	---

None
------

<b>9</b>	<b>MANAGEMENT AND ADMINISTRATIVE DUTIES</b>
----------	---

9.1 List your involvement in departmental activities (e.g. administrative functions), faculty (e.g. faculty committees) or other university activities.

## 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

10.5 Referee duties

(e.g. journals, dissertations/theses)

Conferences:

- 1 Refereed 3 papers for the 31st International Congress and Exhibition on Condition Monitoring and Diagnostic Engineering 2018
- 2 Refereed 4 papers for the Turbo Expo Turbomachinery Technical Conference & Exposition 2020

Journals:

- 3 Referee for Mechanical Systems and Signal Processing (2018 - present)
- 4 Referee for Shock and Vibration (2019)

## 11 AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

11.1 Evaluation status as scientist/scholar

11.2 Research awards and prizes

11.3 Teaching awards and prizes

11.4 Artistic awards and prizes