



Dr. René Heim

Research Motivation

My studies in Bioengineering and Plant Ecology shaped my interest in interdisciplinary research. I believe that the most vexing challenges human society faces cannot be solved unilaterally. A key interest is transferring and developing methods in optical remote sensing and applying them in digital disease detection and precision agriculture. With my research, I am hoping to optimize agricultural practices for securing a sustainable and healthy food production while mitigating their environmental impact.

Contact Information



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EDUCATION & QUALIFICATIONS

- Doctor of Natural Sciences, 2019** (1.0 – Magna Cum Laude)
Remote Sensing of Plant Diseases, Macquarie University/Hamburg University, Australia/Germany.
- Master of Science, 2014** (1.1 - Excellent)
Remote Sensing of Functional Plant Traits, Hamburg University, Germany.
- Bachelor of Science, 2012** (2.1 - Good)
Bioengineering, University of Applied Sciences Hamburg, Germany.
- Biological-Technical Assistant, 2006** (3.0 - Satisfactory)
Schulen Dr Kurt Blindow, Niedersachsen, Germany.

CAREER PATH

- Postdoctoral Researcher, 2020-date**
Department of Plants and Crops, UAV Research Centre, Ghent University, Belgium.
- Co-Lab Head, 2021-date**
Forestry and Agricultural Biotechnology Institute, Remote Sensing of Plant Health, University of Pretoria, South Africa.
- Postdoctoral Researcher, 2019-2020**
Herbert Wertheim College of Engineering, University of Florida, USA.
- R&D Engineer, 2017-2018**
Plant Stress UAV Remote Sensing, SKYLAB GmbH, Germany.
- Research Assistant, 2016-2018**
Department of Environmental Sciences, Macquarie University, Australia.
- Freelancer, 2012-2015**
Technical Service and Transport, Schirmherrschaft GmbH, Germany.
- Trainee, 2011-2012**
Department of Biology/Plant Pathology, Hamburg University, Germany.
- Employee, 2007-2008**
Blood Plasma Fractionation, Octapharma GmbH, Germany.

PhD Candidature

FUNDING TRACK RECORD

- Erasmus, 2010**
European Commission, Semester at University of Valencia, Spain. € 1200
- Research Excellence Scholarship, 2015**
Macquarie University, PhD Research Funding. AU\$ 52800
- National Mobility Grant, 2016**
Ecological Society of Australia. AU\$ 240
- International Mobility Grant, 2018**
German Academic Exchange Service. € 1200
- Postgraduate Research Fund, 2018**
Macquarie University. AU\$ 3000

Key Skills



UAV Remote Sensing



Cross-Disciplinary Communic.



Python/R

Languages



Key Personality Traits

- Open
- Independent
- Conscientious

Fellowship, 2018

German Scholarship Foundation. € 17400

International Mobility Grant, 2020

Flanders Scientific Research Fund. € 250

Start Up Funding – Remote Sensing of Plant Health Lab, 2020

FABI and University of Pretoria. € 40000

ACADEMIC ACHIEVEMENTS

Tony Price Award for Plant Biology Research, 2016

Macquarie University. € 1000

Barbara Rice Memorial Award, 2017

Macquarie University. € 500

Poster Award, 2018

British Ecological Society. € 290

SCIENTIFIC ENGAGEMENT

Since 2015, I gave 6 talks at multiple international conferences in the field of remote sensing, plant pathology, and plant ecology. I presented 2 conference posters and was invited to give 3 talks at international conferences or workshops. Since 2017, I have been involved in the organization of several departmental events such as summer fests, workshops, and small conferences. I was elected to advocate the interests of graduate students at the Hamburg University of Applied Sciences and at Macquarie University in Sydney Australia. Also at the Macquarie University, I co-founded and ran the Macquarie R Users Group that represented a data science learning and presentation platform for staff and students across all departments. Between 2018 and 2020, I was a leader of the Open Plant Pathology Network.

TEACHING

Between 2015 and now, I have been teaching and tutoring various courses in plant biology, remote sensing, and data science. Also, I developed teaching material for a foundational course in botany and for the application of remote sensing tools and software. I have been providing introductory courses for the statistical programming language R as a certified instructor.

SUPERVISION

Higher Degree Research students: Since 2017, supervisor (Principal or Co-supervisor) for 3 HDR students (1 PhD, 1 MSc, 1 BSc), with 2 completions and 1 student currently enrolled

PEER REVIEW & EDITORIAL ROLES

Associate Editor for the *Journal of Plant Disease and Protection*, 2021-date.
Ad hoc referee for 10 international journals including *Remote Sensing of Environment*, *Plant Pathology*, *New Phytologist*, *Scientific Reports*, and *Phytopathology*.

Secondary Skills



Inventiveness



Pragmatism



Meticulousness

Career Focus

It is important to me to think freely and exchange my ideas and thoughts with others. I like to spark excitement and enthusiasm. In my opinion, knowledge should always be linked to purpose and responsibility. Therefore, growing and thriving at the intersection of research, education, and industry seems to be the right place for me.

Personal Interests



Sports



Botany and Gardening



Epicure

PUBLICATIONS

- Ajamian, C; Chang, HC; Tomkins, K; Farebrother, W; **Heim, RHJ**; Rahman, S. **2021**. Identifying invasive weed species in alpine vegetation communities based on spectral profiles. *Geomatics* 1 (2), 177-191, doi: <https://doi.org/10.3390/geomatics1020011>
- Funghi, C; **Heim, RHJ**; Schuett, W; Griffith, SC; Oldeland, J. **2020**. Estimating food resource availability in arid environments with Sentinel 2 satellite imagery. *PeerJ* 8:e9209, doi: <https://doi.org/10.7717/peerj.9209>
- **Heim, RHJ**; Carnegie, AJ; Zarco-Tejada, PJ. **2019**. Breaking down barriers between remote sensing and plant pathology. *Tropical Plant Pathology*, 44, 4, doi: 10.1007/s40858-019-00300-4
- **Heim, RHJ**; Wright, IJ; Scarth, P; Carnegie, AJ; Taylor, D; Oldeland, J. **2019**. Multispectral, aerial disease detection for myrtle rust (*Austropuccinia psidii*) on a lemon myrtle plantation. *Drones*, 3, 25, doi: 10.3390/drones3010025
- **Heim, RHJ**; Wright, IJ; Geedicke I; Allen, A; Oldeland, J. **2019**. Developing a spectral disease index for myrtle rust (*Austropuccinia psidii*). *Plant Pathology*, 68, 738-745, doi: 10.1111/ppa.12996
- **Heim, RHJ**; Wright, IJ; Chang, HC; Carnegie, AJ; Pegg GS; Lancaster, EK; Falster, DS; Oldeland, J. **2018**. Detecting myrtle rust (*Austropuccinia psidii*) on lemon myrtle trees using spectral signatures and machine learning. *Plant Pathology* 67, 1114-1121, doi: 10.1111/ppa.12830.
- **Heim, RHJ**; Jürgens, N; Große-Stoltenberg, A; Oldeland, J. **2015**. The effect of epidermal structures on leaf spectral signatures of Ice Plants (Aizoaceae). *Remote Sensing* 7, 16901–16914, doi: 10.3390/rs71215862.
- Falter, C; Ellinger, D; von Hülsen, B; **Heim, RHJ**; Voigt, CA. **2015**. Simple preparation of plant epidermal tissue for laser microdissection and downstream quantitative proteome and carbohydrate analysis. *Frontiers in Plant Science* 6, 1-9, doi:10.3389/fpls.2015.00194

MEMBERSHIPS

- Deutschen Phytomedizinischen Gesellschaft e.V. (DPG)

ACADEMIC REFEREES

- **Bernard Slippers**
Director of FABI at the University of Pretoria, South Africa.
bernard.slippers@fabi.up.ac.za
- **Ian Wright**
Professor at Macquarie University, Australia.
ian.wright@mq.edu.au
- **Wouter Maes**
Professor at Ghent University, Belgium.
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