



“Probabilistic Dynamics Analysis and Lubricant Analysis to Improve Reliability of Gearboxes”

Grant # 2015/50026-1

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Texas Tech University, USA

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UNESP/Ilha Solteira, Brazil

Outline

- Workshops
- Symposium
- Book
- Conferences and Presentations
- Texas and Brazil Exchange Activities
- Research Activities



Workshops



PPHMES
Probabilistic Prognostics and Health
Management of Energy Systems

Probabilistic Prognostics and Health Management of Energy
Systems Workshop

December 14 and 15, 2015

Universidade Estadual Paulista - Ilha Solteira, SP, Brasil



- **Event sponsored by**

- ✓ FAPESP
- ✓ UNESP/Ilha Solteira

- **40 attendees**

- ✓ Academia, industry and students

- **Invited speakers from Brazil**

- ✓ São Paulo State University (UNESP)
- ✓ University of São Paulo (USP)
- ✓ EMBRAER
- ✓ PETROBRAS

- **Invited speakers from USA**

- ✓ Texas Tech University
- ✓ National Renewable Energy Laboratory



Workshops



2nd Workshop on Probabilistic Prognostics and Health Management of Energy Systems May 15 - 16, 2017 | Lubbock, Texas, USA



- **Approx. \$22k sponsored by**
 - ✓ Edward E. Whitacre Jr. College of Engineering (TTU)
 - ✓ Department of Mechanical Engineering (TTU)
 - ✓ Group NIRE (TTU)
 - ✓ GLEAMM (TTU)
 - ✓ West Texas A&M University
 - ✓ National Wind Institute
 - ✓ FAPESP
- **60 attendees**
 - ✓ Academia, industry and students
- **Student posters**
 - ✓ 6 graduate students from TTU and other universities



Workshops



2nd Workshop on Probabilistic Prognostics and Health Management of Energy Systems May 15 - 16, 2017 | Lubbock, Texas, USA

• Invited speakers from USA

- ✓ Case Western Reserve University
- ✓ Georgia Tech
- ✓ NASA Ames Research Center
- ✓ Sandia
- ✓ National Renewable Energy Laboratory
- ✓ Vanderbilt University
- ✓ University of Massachusetts Lowell
- ✓ Los Alamos
- ✓ Texas A&M University
- ✓ Envision Energy, USA

• Invited speakers from Brazil

- ✓ Federal University of Rio de Janeiro (UFRJ-COPPE)
- ✓ São Paulo State University (UNESP/Ilha Solteira)
- ✓ University of São Paulo (USP/São Carlos)
- ✓ Rio de Janeiro State University (UERJ)

• Invited speakers from Europe

- ✓ Vrije Universiteit Brussels
- ✓ Advanced Vector Analytics, Latvia



Symposium

Mini Symposium – UNESP/Ilha Solteira 2017

- **Event sponsored by**
 - ✓ FEPISA
 - ✓ Department of Mechanical Engineering (UNESP/Ilha Solteira)
- **Release of the book “Probabilistic Prognostics and Health Management of Energy Systems”**
- **Invited speakers**
 - ✓ São Paulo State University (UNESP/Ilha Solteira)
 - ✓ São Paulo State University (UNESP/Tupã)
 - ✓ Federal University of Grande Dourados (UFGD)
 - ✓ Texas Tech University
- **50 attendees**
 - ✓ Academia, industry and students



Book

- **Details**

- ✓ 17 chapters
- ✓ 41 authors
- ✓ 277 pages
- ✓ Published May 2017 (Springer)

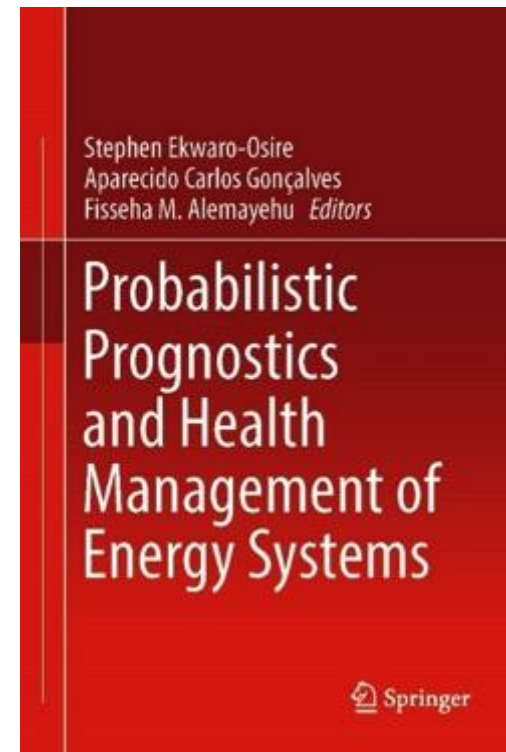
- **Editors**

- ✓ Prof. Stephen Ekwaro-Osire
- ✓ Prof. Aparecido Carlos Gonçalves
- ✓ Prof. Fisseha M. Alemayehu

- **Contributions**

- ✓ Prof. Stephen Ekwaro-Osire (2 chapters)
- ✓ Prof. Aparecido Carlos Gonçalves (2 chapters)
- ✓ Dr. Joao Paulo Dias (1 chapter)

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Conferences and Presentations

- **Peer-Reviewed Conference Publications**

- ✓ Prof. Stephen Ekwaro-Osire (5)
- ✓ Prof. Aparecido Carlos Gonçalves (1)
- ✓ Dr. Joao Paulo Dias (1)

- **Presentations**

- ✓ São Paulo State University, UNESP/Tupã – Dec 11, 2015 (Prof. Stephen Ekwaro-Osire)
- ✓ São Paulo State University, UNESP/Ilha Solteira – Dec 15, 2015 (Prof. Stephen Ekwaro-Osire)
- ✓ Rio de Janeiro State University, UERJ – May 22, 2017 Prof. Stephen Ekwaro-Osire)
- ✓ Military Institute of Engineering, IME – May 23, 2017 (Prof. Stephen Ekwaro-Osire)
- ✓ São Paulo State University, UNESP/Ilha Solteira – May 25, 2017 (Prof. Stephen Ekwaro-Osire and Dr. Joao Paulo Dias)
- ✓ Federal University of Santa Catarina, UFSC – May 29, 2017 (Prof. Stephen Ekwaro-Osire)



Texas and Brazil Exchange Activities

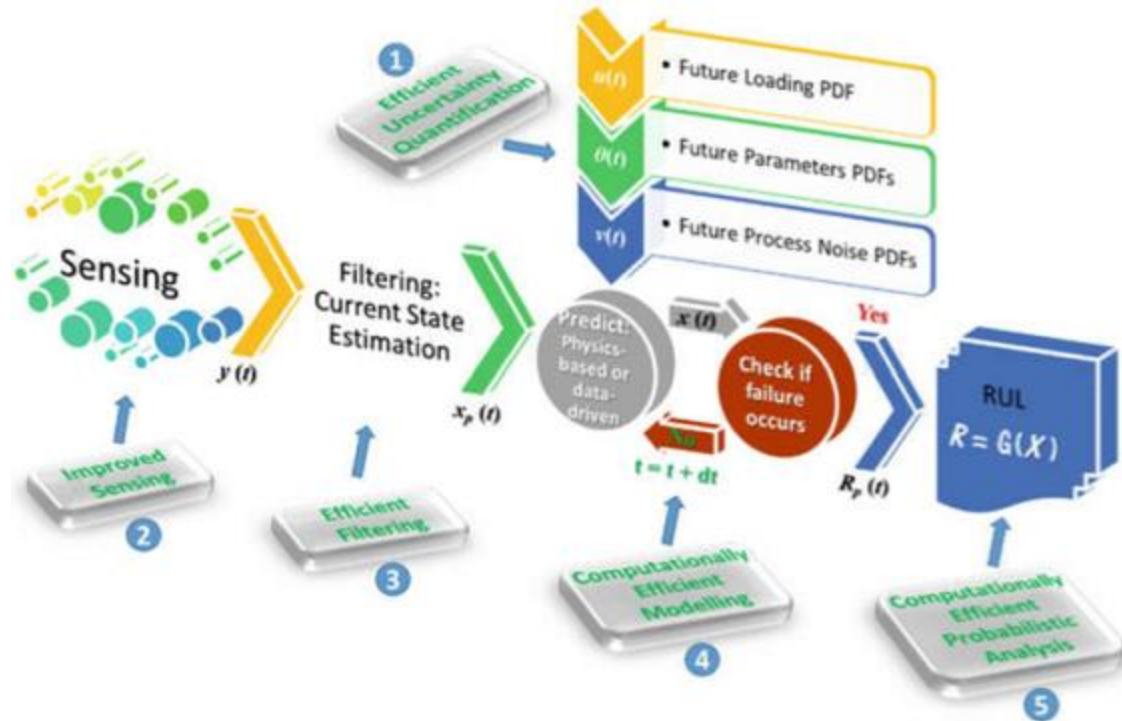
- **Postdoc:** Dr. Joao Paulo Dias
- **Students Participation:** 6 students (TTU), 10 students (Brazil)
- **Prof. Ekwaro and Dr. Dias presented at:**
 - ✓ Federal University of Santa Catarina (UFSC)
 - ✓ São Paulo State University (UNESP/Ilha Solteira)
 - ✓ São Paulo State University (UNESP/Tupã)
 - ✓ Rio de Janeiro State University (UERJ)
 - ✓ Cataratas Dynamic University (UDC)
- **Prof. Ekwaro and Prof. Gonçalves invited speakers to TTU from Brazil:**
 - ✓ Federal University of Rio de Janeiro (UFRJ-COPPE)
 - ✓ São Paulo State University (UNESP/Ilha Solteira)
 - ✓ University of São Paulo (USP/São Carlos)
 - ✓ Rio de Janeiro State University (UERJ)



Research Activities

Condition-based probabilistic prognostics and health management (PPHM)

- Efficient Uncertainty Quantification
- Improved Sensing
- Efficient Filtering
- Computationally Efficient Modelling
- Computationally Efficient Probabilistic Analysis



Research Activities

- **Published Results**

- ✓ Numerous book chapters, conferences

- **Current Research Questions (Future Works)**

- ✓ Mr. Ozhan Gecgel
- ✓ Ms. Shweta Dabetwar
- ✓ Mr. Abraham Nispel
- ✓ Prof. Aparecido Carlos Gonçalves
- ✓ Dr. Joao Paulo Dias
- ✓ Prof. Stephen Ekwaro-Osire
- ✓ Prof. Haile Endeshaw
- ✓ Prof. Fisseha Alemayehu
- ✓ Prof. Americo Cunha

