Guidelines for STERG members in 2020

STERG

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Contents

Info

To keep this document up to date, please report any errors such as broken hyperlinks or outdated information to Leigh.

 With any questions with regards to marketing material / corporate identity please contact Tristan.

1 Digital Infrastructure at STERG

1.1 Software Ownership and Skills

Below, a selection of available software suites at STERG are listed.

- Numerical computation: MATLAB, SciLab

- Solar modeling: SAM, Greenius, PolySun, TSol, RetScreen

- Raytracing: SolTrace, Tonatiuh

- CFD and thermal modeling: FLUENT, TRNSYS, FLOWNEX, Ebsilon Professional

- CAD: Inventor, Catia, Solid Works, AutoCAD

- FEM: Patran

- Programming: FORTRAN, C, Visual Basic, Python, Delphi, C#, Codevision AVR

- Miscellaneous: LabView, Diptrace, LaTeX, Mendeley, Inkscape, Sketchup

STERG purchased licenses for a number of the commercial software packages listed above. For installation of the most important software packages the software 'owners' are listed:

- MATLAB[1]: Christoph

- FLUENT: Dr. Jaap Hoffmann

- FLOWNEX: Tristan

- Ebsilon Professional: Christoph

- LaTeX: Andreas

1.2 Departmental Data Backup System

The department provides (subject to availability) an automated data backup system for postgraduate students connected to the mechanical engineering network. The system is currently administered by Reynaldo Rodrigues, for further questions feel free to contact Reynaldo at the department of Mechanical and Mechatronic Engineering.

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[1]The university has acquired a campus wide Matlab license, activation key 13452-56192-52887-66175-96715, TAH license 40558920

1.3 Departmental Simulation computer

The department provides (subject to availability) a high performance computer. The machine is equipped with 16 E5-2643, 3.3 GHz processors, 256 GB RAM and 1.0 TB HDD. It is operated by a Scientific Linux OS. The computer is under responsibility of Dr. Hoffmann, for further questions feel free to contact Dr. Hoffmann directly.

1.4 STERG SharePoint

The SharePoint is a web-based platform to store information and share data. You should have permission to SharePoint, if not contact owner Leigh van der Merwe.

Note that the SharePoint might only work from within the SU network. You log in using your SUN username and password.

1.5 STERG Website

Stay up to date with STERG news items at https://sterg.sun.ac.za/news/ and STERG publications at https://sterg.sun.ac.za/publications/. For general communication, we recommend providing concentrating.sun.ac.za as the hub for CSP research at Stellenbosch University. The direct link to our research group's web presence is sterg.sun.ac.za.

1.6 Corporate Identity

STERG has a corporate identity that consists of a logo, a font and a set of colours. If you want to represent STERG you are encouraged to use the font and the colours. However, you are requested to not edit the logo.

1.6.1 STERG Logo

The STERG logo is stored as a large image and a vector graphic on the Share-Point.

Figure 1: STERG logo in the only configuration it is intended to be used

The STERG sun, the STERG letters as well as 'Solar Thermal Energy Research Group' form a logo that is to be used only in that arrangement as is the STERG 'corporate' logo only in its entirety.

1.6.2   Fonts

In case you want to layout a document in the STERG font, use Montserrat. The Font is found on SharePoint here and here (you will need to download both).

How to install new fonts in Windows: click here

How to install new fonts on Macs: click here

Important note: Fonts are mean!
If you type a text on your computer on a non-standard font (such as Montserrat), the text will appear in a different standard font on another machine that does not have the additional font installed. Possible solutions are creating a pdf or embedding the font in the particular file. **We recommend sticking to standard fonts** unless you intend to be fancy for marketing material or perhaps a poster (= stuff that is circulated in print form).

1.7   STERG Templates

The following templates are provided by STERG.

1.7.1   PowerPoint

The generic STERG PowerPoint template(s): SharePoint.

Note that the PowerPoint template has the Montserrat font embedded, which allows to show the presentation as intended on any computer.

Warning: The presentation is in a 16:9 format. This corresponds to standard screens. Projectors are typically 4:3 format. Make sure to test run your presentation prior to an important event!

Be aware that specific templates are usually provided by STERG for major events, e.g. SASEC, STERG symposium and SolarPACES. These will be circulated via email.

1.7.2   Poster

Scientific conferences typically require posters in the A0-format. STERG has developed a poster template.

Please act with care when amending the poster to suit your purposes. Freedom is provided intentionally to edit the poster but please attempt to not disturb the corporate identity, such as color selections, background, etc.

1.7.3 E-mail Signature

STERG has its own e-mail signature which members may use if they wish to represent STERG. A decision was made by the Rectors Management Team to align all SU email signatures. A standardised STERG-version of the Centenary email signature has been created and you are welcome to make use of the email signature template on the SharePoint with some instructions and help also on the SharePoint.

Please adapt the email signature template with your details but do not alter the appearance as it is aligned with the university's corporate identity.

A default signature is shown in Figure 2.

Figure 2: The new STERG email signature complying with SU centenary celebrations

1.8 Internet and ADSL

The Department of Mechanical and Mechatronic Engineering provides an ADSL line that can be used free of charge. Researchers that are situated at Mechanical and Mechatronic Engineering (e.g. K419, roof lab, M202) can have their PCs connected to ADSL. Ownership of ADSL is (status January 2017) with Prof. Venter.

2 Compilation of Theses and Scientific Documents

2.1 Mathematical Typesetting

This is a summary of some basic rules of typesetting. More details about most topics can be found in a document by Dr. Els[2].

Spaces

- Between a value of a quantity and its unit is a non-breaking (small) **space** [*Ctrl+Shift+Space* in Word, *Alt+0160* in PowerPoint]. This space has always the same width and doesn't break over lines. A space is also to be set before the percentage sign (3 %) and before degrees Celsius (3 ℃) but not before the angular degree sign (3°).

- The SI-conform separator for numbers with more than 4 digits is also a non-breaking space. Commas or points are ambiguous.

- The used **decimal indicator** in American and British English is the full stop/period[3]. An accordingly typed quantity is: 123 456.78 kW.

Roman/Italic

- Variables in mathematical equations **and** in the text should be written in *italic* letters.

- Units and functions should be written in roman letters (upright like this text).

- Universal constants and **descriptive** subscripts should be written upright, **variables** in subscripts in italics.

$$E = m\,c^2$$

$$F = \sum_{i,j}^{n} (T_{\mathrm{amb},i}\,\xi_j)\,\mathrm{kJ/K}$$

$$\frac{\mathrm{d}u}{\mathrm{d}t} = \sin 5x$$

'E' and 'm' are variables.
'c' is the universal speed of light.
'F', 'T', 'i' and 'j' are variables.

The subscript 'amb' is descriptive.
'kJ/K' is a unit.
'd' and 'sin' are functions.
'u', 't' and 'x' are variables.

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[2]Guide for the Use of the International System of Units (SI)

[3]Although the comma is used in South African English, the period is recommended and commonly used in academia since we are working in international research.

General Rules Equations have to solve for units.

One correct way:

$$\dot{Q}_{\mathrm{loss}} = \left[0.141\,(t/°\mathrm{C}) + 6.48 \times 10^{-9}\,(t/°\mathrm{C})^4\right]\mathrm{W/m}$$

Incorrect:

$$\dot{Q}_{\mathrm{loss}} = \left[0.141\,t + 6.48 \times 10^{-9}\,t^4\right]\mathrm{W/m}$$

Try to be consistent with the variables. For example, don't use Q for heat and heat *rate*. It is good practice to use $\dot{Q}$ for the latter.

2.2 SU Documents for Theses

Current SU Mechanical Engineering templates and guidelines can be found on the departmental website.

2.3 Language Selection

Each researcher has the freedom to decide on his choice of language in writing a thesis. You should be careful to stick to one selected language throughout your work. The selection of AE vs. BE should be carefully considered and discussed with the study leader/supervisor.

At this point, be advised that the default language at STERG is American English. This choice has come naturally as a consequence to the CSP community and the major journals/conferences being operating in AE.

It is each individuals freedom to write a thesis in BE or AE. It has to be stressed that care has to be taken with regards to names of technologies that might have been created with in a specific language (especially spelling of pressuri**z**ed vs pressuri**s**ed). It is case dependent how to handle such situation, but generally good practice to write such technologies in your language choice with a footnote elaborating on the original name and done changes.

2.4 Name(s) of our University

University corporate identity guidelines encourage the use of 'Stellenbosch University' when referring to this university.

3 Publications and Conferences

3.1 Keeping track

Please kindly notify Leigh once you have an accepted publication. It is important for us to keep track as it is a performance metric of the research group towards our funders as well as our effort to keep our website with current publications up to date.

3.2 List of Accredited Journals

The decision in which Journal to attempt a publication is generally a matter a researcher will discuss with his/her supervisor. Make that decision carefully and consult researchers with experience in publishing.

The journals accredited by the Department of Higher Education and Training (DHET) are provided on the university website. A couple of useful ac- credited examples are:

- JOURNAL OF SOLAR ENERGY ENGINEERING — TRANSACTIONS OF THE ASME

- SOLAR ENERGY (at Elsevier)

- SOLAR ENERGY MATERIALS AND SOLAR CELLS

- RENEWABLE & SUSTAINABLE ENERGY REVIEWS

- EXPERIMENTAL THERMAL AND FLUID SCIENCE

- ENERGY POLICY

- APPLIED ENERGY

- APPLIED THERMAL ENGINEERING

3.3 Important Conferences

3.3.1 SolarPACES

SolarPACES is THE annual global CSP conference with the who's who in CSP in attendance. Presenting at SolarPACES means exposure and a huge opportunity for networking at the highest level. Many researchers have received very valuable feedback to their work at SolarPACES. All big research institutions and companies are present.

SolarPACES is an annual conference typically hosted in September or October with the abstracts and (double peer reviewed) papers being due end of May and August, respectively. SolarPACES2020 will be hosted in Albuquerque, New Mexico, USA from 29 September – 2 October.

3.3.2 SASEC

The SASEC (Southern African Solar Energy Conference) is the only regional research conference with focus on solar energy. The annual conference is hosted at an institution in southern Africa. STERG is the major contributor in CSP research. Further separate CSP research from national and international contributors is typically presented.

3.3.3 Annual STERG Symposium

STERG hosts its annual research symposium (endorsed by SolarPACES) around July each year. The STERG symposium provides postgraduate students with a good opportunity to share their work with a larger audience and is a good dry-run for SolarPACES presentations. The event is typically held over two days, coinciding with the annual Renewable Energy Postgraduate Symposium (REPS), hosted by the Centre for Renewable and Sustainable Energy Studies (CRSES). Details regarding the 7th Annual STERG Symposium will be communicated in due course.

3.4 Previous Proceedings

Leigh keeps a collection of all SolarPACES proceedings since 2006. Contact her for access.

4 Previous STERG Research

Lists of publications (journal articles, conference proceedings, theses, etc.) by STERG members can be found on the STERG website.

5 Security at k419

Security at Stellenbosch University is a very important and often underestimated topic!

Even at CRSES next door to k419, theft has been attempted during day time. Please follow a couple of basic steps to avoid easy intrusion into our offices.

The entrance door to k419 is equipped with a magnetic lock. It is extremely important to keep that door mechanically locked overnight.

If you are not sure if another person might not return to work after having left, play it safe and lock up the office.

The procedure for the last one leaving k419 in the afternoon/evening is:

- close sliding door and lock it. If it is closed double-check if locked

- switch off kettle

- switch off water filter (switch on back side)

- switch off lights

- set alarm

- lock the door

If you need a key to k419 or have any further questions with regards to security, please speak to Leigh.

6 Physical Infrastructure at STERG

STERG has a number of machines, instruments and systems available to use. A good overview is provided on the STERG website.

6.1 The STERG Roof Laboratory

The STERG roof top laboratory is administered by Dr Willie Smit. Should you wish to make use of the laboratory or any of the equipment available through the laboratory, please contact Dr. Willie Smit for arrangements.

The normal rules and regulations set out by the Department of Mechanical and Mechatronic Engineering and/or through Mr. Cobus Zietsman apply for the Solar roof top laboratory. Should you intend to run an experimental campaign on the roof lab, please contact Dr Smit early to understand what additional

safety implications need to be considered (e.g. bright spots, mirror/heliostat reflection onto neighboring buildings/offices, excessive temperatures, etc.). This is of particular relevance when intending to operate any of the Helio40 infrastructure (heliostats, tower or both). It has shown in the past that early communication helps as most problems can be addressed with adequate safety precautions and processes.

6.2 SUNREC

STERG operates a significant share of the Stellenbosch UNiversity Renewable Energy Centre (SUNREC) at Elsenburg. With any questions towards SUNREC or interest to conduct experiments there, please contact Prof Craig McGregor.

6.3 STERG mini-library

STERG has a mini-library with some useful books available in k419. To view the titles go to the SharePoint. The library is managed by Leigh.

Procedure for checking out books

1. note the code of the book you want to take out, e.g. AMBE01 (Available on excel spreadsheet or the book itself)

2. sign the book out with Leigh in k419 during office hours only: 08:00 – 13:00

3. you are responsible for returning the book within four weeks from the date of taking out

4. the book must be signed back in by you personally

6.4 Printers

All STERG offices are equipped with laser printers to assist students with their research needs. The usage of these printers is limited to research purposes only and excludes usage for private purposes and coursework printing. STERG reserves the right to limit the allocation of toners and paper, should continued unreasonable consumption occur.