

Star Program Assignment

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- The first two parts are given to help you efficiently conduct your research project. If you are not convinced, please refer to: <http://keysan.me/okst/> :)
- We want you to contribute to theoretical parts as well, or at least understand it, not just improve your practical skills on using some software.
- Go step-by-step in your assignment. If you got stuck, please do not hesitate to consult us. You can always send e-mails, or drop by to PowerLab offices to talk in person.
- Try to show your progress and get feedback from us during the assignment. Do not wait until you have a “final” version. [Github](#) is a good way to show your progress.
- We encourage you to work with your friends, share ideas and help each other. They are NOT your opponents. After all, Research League is a team !

1. Version Control

- Learn about version control. You may refer to:
http://keysan.me/presentations/is500/version_control.html
- Get a Github account, follow <https://github.com/ozank> and <https://github.com/mesutto/>
- Download Sourcetree (<https://www.sourcetreeapp.com/>)
- Create your first repository and make your first commits
- **Use Github to reveal your progress during this assignment**

2. Research Tools

- Get a Mendeley account (<https://www.mendeley.com/>) and follow <https://www.mendeley.com/profiles/mesut-ugur1/> and <https://www.mendeley.com/profiles/ozan-keysan/>
- Download Mendeley to your computer and add papers of your interest to a folder you created
- Check the properties (taking notes, highlighting etc.)
- **Use Mendeley to reveal your research progress during this assignment**

3. Join to PowerLab Maillist - Seminars

- Please visit PowerLab web page (<http://power.eee.metu.edu.tr/>)
- Join to the PowerLab maillist (<http://power.eee.metu.edu.tr/join-us/>)
- Attend to the PowerLab Seminars (<http://power.eee.metu.edu.tr/seminars/>) and workshops

4. Research Topic

- Add the following papers to your mendeley folder and study them throughout this assignment.
 - Hennen, M. D., Niessen, M., Heyers, C., Brauer, H. J., & De Doncker, R. W. (2012). Development and control of an integrated and distributed inverter for a fault tolerant five-phase switched reluctance traction drive. *IEEE Transactions on Power Electronics*, 27(2), 547–555.
<http://doi.org/10.1109/TPEL.2011.2132763>
 - Wang, J., Li, Y., & Han, Y. (2013). Evaluation and design for an integrated modular motor drive (IMMD) with GaN devices. *2013 IEEE Energy Conversion Congress and Exposition, ECCE 2013*, (Immd), 4318–4325.
<http://doi.org/10.1109/ECCE.2014.6647278>
- Prepare a brief presentation (10 minutes long) related to the papers.

5. Challenge

Design and implement a temperature measurement device with a micro-controller platform other than Arduino or a similar device. You are asked to implement a register-level embedded software.

TI's DSP kits are advised, since they will be used in the actual project.

- Download Code Composer Studio (it's free on TI's website) and learn how to use it.
- Design the hardware (sensor and display) with very simple components.
- Learn about the basic modules (Digital I/O, Interrupt, ADC, PWM).
- Develop your code and test your device.

Bonus: Use your design to perform a temperature controller (hysteresis) by using a fan.