Deep Learning

Course overview

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Course overview

Course Content

1. Artificial Neural Networks
2. Convolution Neural Networks
3. Recurrent Neural Networks
4. Encoder-Decoder Architecture
5. Text processing
6. Transformer models
7. ...

Bibliography i

- Towards Data Science, Papers with Code, ...
- ATIENZA, Rowel. Advanced Deep Learning with TensorFlow 2 and Keras: Apply DL, GANs, VAEs, deep RL, unsupervised learning, object detection and segmentation, and more. 2nd edition. Packt Publishing, 2020. ISBN 978-1800568273.
- KROHN, Jon, Grant BEYLEVELD a Aglaé BASSENS. *Deep learning illustrated: a visual, interactive guide to artificial intelligence*. Boston: Addison-Wesley, [2020]. ISBN 978-0135116692.
- KELLEHER, John D. *Deep learning*. Illustrated edition. Cambridge: The MIT Press, 2019. MIT Press essential knowledge series. ISBN 978-0262537551.
- HOWARD, Jeremy a Sylvain GUGGER. *Deep learning for coders with Fastai and PyTorch: Ai applications without a PhD*. Sebastopol, CA: O´Reilly, 2020. ISBN 978-1-492-04552-6.

Bibliography ii

- SAITOH, Koki. *Deep Learning from the Basics: Python and Deep Learning: Theory and Implementation*. Birmingham, UK: Packt Publishing, 2021. ISBN 978-1800206137.
- GOODFELLOW, Ian, Yoshua BENGIO a Aaron COURVILLE. *Deep learning*. Illustrated edition. Cambridge, MA: MIT press, 2016. Adaptive computation and machine learning series. ISBN 978-0262035613.
- AGGARWAL, Charu C. Data mining: the textbook. New York, NY: Springer Science+Business Media, 2015. ISBN 978-3-319-14141-1.
- BRAMER, M. A. Principles of data mining. London: Springer, 2007. ISBN 1-84628-765-0.
- LESKOVEC, Jurij, Anand RAJARAMAN a Jeffrey D. ULLMAN. Mining of massive datasets / Jure Leskovec, Standford University, Anand Rajaraman, Milliways Labs, Jeffrey David Ullman, Standford University. Second edition. Cambridge: Cambridge University Press, 2014. ISBN 9781107077232.

Bibliography iii

- WITTEN, Ian H., Eibe FRANK, Mark A. HALL a Christopher J. PAL. Data mining: Practical machine learning tools and techniques. 4th ed. Amsterdam: Morgan Kaufmann, 2017. Morgan Kaufman series in data management systems. ISBN 978-0-12-804291-5.
- ZAKI, Mohammed J. a Wagner MEIRA JR. Data Mining and Analysis: Fundamental Concepts and Algorithms. 2nd edition. Cambridge, GB: Cambridge University Press, 2020. ISBN 978-0521766333.

Course Evaluation - Full-time students

- Exercise tasks finishing (10 to 20 points):
  - up to 2 points for finishing task at the exercise or at home.
- Project with Convolutional Neural Networks (10 to 20 points):
  - Select a smaller dataset and apply a Convolutional Neural Networks.
  - A Jupyter Notebook with description.
- Project with Recurrent Neural Networks (10 to 20 points):
  - Select a smaller dataset and apply a Recurrent Neural Networks.
  - A Jupyter Notebook with description.
- Larger project realization from external server, e.g. KAGGLE (20 to 40 points):
  - Select a proper dataset and problem definition from the external server, e.g. Kaggle, (selection have to be confirmed by the lecturer)
  - A Jupyter Notebook with description of the steps.

Questions?