Henry E. Clausen

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Education

University of Edinburgh   **Edinburgh, UK**
Ph.D. in Computer Science   *4/2018 – 2021*
Contextual Anomaly Detection in Computer Networks

Imperial College   **London, UK**
M.S. in Statistics, high Distinction (81/100)   *10/2016 – 9/2017*
Thesis: 'Modelling human behaviour in computer networks' (86/100)

Swiss Fed. Institute of Technology   **Zurich, Switzerland**
M.S. in Physics, GPA – 5.5 (excellent)   *2/2014 – 2/2016*
Thesis: 'Tri-Criteria Optimization for Scenario-Based Risk Measures'

Swiss Fed. Institute of Technology   **Zurich, Switzerland**
B.S. in Physics, GPA – 4.9 (good)   *9/2010 – 9/2013*
Presentation: 'Cross-sections, decay rates and Feynman rules'

Work Experience

BT Group   **Ipswich, UK**
Student placement   *08/2019 – 10/2019*

- Attack implementation and data generation
- Design of *convolutional neural networks* for attack detection
- Strategy planning for large-scale data capture

OLZ & Partners   **Zurich, Switzerland**
Technical consultant   *6/2016 – 9/2016*

- Implementation of optimization algorithms for complex constraints
- Advice and comparison of computational solvers
- Technical talk in front of entire company

Swiss Fed. Institute of Technology   **Zurich, Switzerland**
Research Assistant   *2/2016 – 6/2016*

- Designing and testing of optimization algorithms for mixed-integer problems
- Numerical algorithms for large-scale financial optimization
- Cooperations with Stoxx Index Provider

Relevant Technical Projects

Contextual Anomaly Detection in computer networks   **University of Edinburgh**
Ph.D thesis   *4/2018 – 2021*

- Data-driven anomaly detection for enterprise cyber-security
- Development of *LSTM-encoder* language models to identify
  contextual structures in TCP commections
- Automatised dataset creation for ground truth network and system data
- Industry cooperation with BT Research

Modeling human behaviour in computer networks   **Imperial College**
Master thesis (86/100)   *5/2017 – 9/2017*

- Development of sequential *Unsupervised learning* methods for enterprise network logs
- Extensive usage of *Spark* for data assessment and model fitting
- Publication of results and release of R-package

Relevant Skills

Publications

- **Clausen, H.**, Grov, G., Aspinall, D. (2021): 'CBAM: A contextual model for network anomaly detection', (*under review*).
- **Clausen, H.**, Aspinall, D. (2021): 'Controlling network traffic microstructures for machine-learning model probing', *EAI SecureComm 2021*.
- **Clausen, H.**, Aspinall, D. (2021): 'Examining traffic micro-structures to improve model development', *Workshop on Traffic Measurements for Cybersecurity (WTMC) at IEEE S&P conference, 2021*.
- **Clausen, H.**, Gibson, M., Aspinall, D. (2020): 'Evading stepping-stone detection with enough chaff', *Network and System Security (NSS'2020) conference, Melbourne, Australia, November 25-27, 2020*.
- **Clausen, H.**, Sabate, M., Grov, G., Aspinall, D. (2020): 'Better anomaly detection for access attacks using deep bidirectional LSTMs', *Conference on Machine Learning for Networking (MLN'2020), Paris, France, November 24-26, 2020*.
- **Clausen, H.**, Flood, R., Aspinall, D. (2019): 'Traffic generation using Containerization for Machine Learning', *ACSAC - Dynamic and Novel Advances in Machine Learning and Intelligent Cyber-Security Workshop, San Juan, PR, USA, December 9-10, 2019*.
- **Clausen, H.**, Adams, N.M., Briers, M. (2018): 'A Bayesian Approach to Modelling Human Behaviour in Computer Networks', *Data Science for Cyber-Security, World Scientific*

Additional Experience

Greenpeace <div align="right">**Zurich/Edinburgh**</div>
Local group leader <div align="right">*from 2011*</div>
- Decision-making and coordination of campaign activities for local group
- Communication of campaign goals/achievements between local group
  and Greenpeace London headquarter
- Campaigning for political campaigns on renewable energies,
  plastic pollution, and deforestation

Swiss Fed. Institute of Technology <div align="right">**Zurich, Switzerland**</div>
Member of the Students' Music Association <div align="right">*from 2/2014*</div>
- Extensive engagement in harmonic theory, the piano, and music production
- Teaching younger students first steps in music production

References

Prof. David Aspinall	*Ph.D. supervisor*	david.aspinall@ed.ac.uk
Dr. Michael Gibson	*Project supervisor at BT Group*	michael.s.gibson@bt.co.uk