

Attaullah Buriro, BEng (Hons), MEng (Hons), PhD.

✉ aburiro@unibz.it ✉ buriro97@gmail.com

🐦 @buriro8 📧 @buriro8 ☎ +39-328-8545515

🌐 https://www.researchgate.net/profile/Buriro_Attaullah

🌐 <https://scholar.google.it/citations?user=u0KYFowAAAAJ>

🌐 <https://www.scopus.com/authid/detail.uri?authorId=54790659000>

🌐 <https://www.linkedin.com/in/attaullah-buriro-03651a52/>



Research Interests

I am an enthusiastic engineer, scientist, and professor (assistant) with extensive experience of applying AI and ML technologies to a wide range of problems in the domains of User Authentication, Age and Gender Estimation from Human Gestures, Malware Analysis, Intrusion Detection Systems, Manufacturing, Computer Vision, and Recommendation Systems. I have demonstrated technical expertise as well as the ability to design, support, and lead processes to create human-centered products

Employment History

- Sept. 2020 – ... 📌 **Assistant Professor:** [Faculty of Computer Science, Free University of Bolzano.](#)
- Carrying out research in the domain of Recommendation systems along with the use of GANs in user authentication domain.
 - Teaching a Master-level course titled “systems security” and supervising the related theses.
- Sept. 2019 – Aug. 2020 📌 **Postdoctoral Research Fellow:** [Faculty of Computer Science, Free University of Bolzano.](#)
- Performed analysis of different CNN classifiers in terms of suitability for wood classification.
 - Developed a spatial and a spectral hyperspectral image classifier to exploit the underlying differences between the spectral and spatial domain.
 - Developed a data augmentation framework using GAN to generate RGB images of Heartwood and Sapwood classes.
 - Developed a data augmentation framework using GAN to generate spectral signatures of Heartwood and Sapwood classes in hyperspectral images.
- Mar. 2018 – Feb. 2019 📌 **Associate Professor (Visiting):** [Khwaja Fareed University of Engineering & Information Technology, Rahim Yar Khan, Pakistan](#)
- Established Department of Information Security and Headed the Department.
 - Prepared the Higher Education Commission (HEC) required document for launching MS in information Security and initiated the admission process from Spring 2019 before leaving.
 - Taught at both bachelor (Internet Architecture and Protocols) and Master (Machine Learning) level.
 - Contributed to the management and administrative processes.
 - Managed and lead major initiatives at the Department of Information Security.
 - Actively involved in the recruitment, management, and development of academic staff.

Employment History (continued)

- Feb. 2017 – Aug. 2019 **Postdoctoral Research Fellow:** [DISI Security and Privacy Lab, University of Trento](#).
- Identified newer human behaviors that could potentially be used for user authentication on new generation devices.
 - Collected data, performed evaluation, and developed proof-of-the-concept user authentication schemes for new generation devices.
 - Targeted top-tier security and privacy venues for reporting the results.
 - Prepared the lectures, labs and course material for the Network Security course.
 - Helped my advisor in the preparation of the research proposals.
- Oct. 2016 – Dec. 2016 **Visiting Scholar:** [imec-DistriNET Security Group, University of Leuven, Belgium](#).
- Did academic collaboration in the mutual area of interest - User authentication.
 - Published a paper out of my stay of 3 months at imec-DistriNET KULeuven.
- Feb. 2016 – Dec. 2017 **Teaching Assistant:** [Network Security \(Masters Course\) University of Trento](#).
- Assisted my advisor in preparing the lectures, labs and the course material.
 - Graded the students' lab reports.
- Jul. 2007 – Nov. 2012 **Electronic/Communication Engineer:** [Pakistan Meteorological Department, National Seismic Monitoring and Tsunami Early Warning System, Karachi, Pakistan](#).
- Installed, managed and troubleshooted the seismic equipment, i.e., Sensors, Digitizer, Data Communication Modules and VSAT equipment like iDirect 3100.
 - Performed weekly data storage (both in raw form and analysed form). Set-up backups for each server (data analyzing server, data storage server, etc.).
 - Installed and managed different type of networks like VSAT, VPN, point to point wireless networks etc, for secure transmission of seismic data to main centre located at Karachi and its back-up at Islamabad.
- Nov. 2009 – Sep. 2012 **Adjunct Faculty:** [Mohammad Ali Jinnah University \(MAJU\) Karachi, Pakistan](#).
- Taught networks (Internet Architecture and Protocols, Switching and Routing Protocols, Data Communication, etc.) and security (cryptography, Network Security, etc.) related courses at both Bachelor and Master level.
 - Contributed to the management and administrative processes at the department.

Research Projects

H2I ■ The main goal of the research activities carried out in the context of the Hyper-Spectral Images for Inspection Applications (H2I) project was to advance the state-of-the-art in hyperspectral image classification domain, in general, and in the agricultural domain. We have published the listed paper^[1]. To be precise, I performed the following activities:

- Analyzed the suitability of different CNN classifiers for wood classification.
- Participated in the development of a Hyperspectral Image classifier based on Computer Vision and Convolutional Neural Networks (CNN) to distinguish between heartwood and sapwood categories.
- Created a spatial and spectral hyperspectral image classifier to take advantage of the underlying differences between the spectral and spatial domains.
- Using GAN, I created a data augmentation framework to generate RGB images and spectral signatures of the Heartwood and Sapwood classes from hyperspectral images.

Robusinter ■ The aim of the project was to create innovative techniques and tools to enhance the stability of the compaction process through adaptive manufacturing. To achieve this objective, we concentrated on determining crucial factors in the compaction process modeling. We employed machine learning models to forecast the product's quality. To be precise, I performed the following activities:

- Analyzed various regression algorithms to estimate the quality characteristics of the produced workpiece.
- Participated in the development of an accurate and light-weight machine-learning-based pipeline for estimating the mass and length of a powder metallurgy workpiece.
- A set of novel hand-crafted features derived from machine signals collected directly from sensors installed on press machines and generated after each stroke is proposed. Furthermore, the important features were identified in terms of their impact on the prediction of quality characteristics.
- Experiment was carried out to assess the feasibility of the light-weight method in producing accurate estimations of quality characteristics of the produced workpiece.
- Collaborated with stakeholders to develop a value chain to address the challenges of acquiring data, evaluating its worth, distilling, and analyzing it.

[1] P. P. Htun et al., "A Lightweight Approach For Wood Hyperspectral Images Classification," 2021 IEEE International Conference on Multimedia & Expo Workshops (ICMEW), 2021, pp. 1-4, doi: 10.1109/ICMEW53276.2021.9455943.

Research Projects (continued)

EIT-Digital Mobile Shield

■ The aim of the project was to detect the fraudulent activity on the smartphone in real time. We proposed, developed, and tested a novel motion-assisted multimodal behavioral-biometric-based user authentication scheme for smartphone^[2].

- For authentication purposes, data analysis techniques were applied to human data collected using smartphones/smartwatches.
- Excellent understanding of the underlying end-to-end process for user authentication, including data collection, data understanding, data cleaning, preprocessing, analysis, classification, and parameter optimization.
- Solid understanding and interpretability of the visualization of the techniques and algorithms' obtained results.
- Analyzed different one-class classifiers in real time to detect fraudulent activity on the smartphone.
- Identified a novel human behavior, which was then developed and tested in the context of a motion-assisted multi-modal-behavioral-biometric-based user authentication scheme for smartphones.
- Multiple participants were involved in collecting and analyzing behavioral data in order to develop a secure and usable user authentication scheme.
- Performed security and usability testing and disseminated the findings in a paper.

NATO-NIAS

■ We actively participated to this pilot project, namely, NATO Cybersecurity incubator, launched by NATO Communications and Information Agency, during the period of January to September 2015, and contributed to their behavioral biometric-based authentication stream. We participated as the mentors in this stream and delivered lectures and developed proof-of-the-concept Android applications. We were able to publish some works^{[3][4][5]}, exploiting this collaboration.

^[2] Buriro, Attaullah, Bruno Crispo, Filippo Del Frari, Jeffrey Klardie, and Konrad Wrona. "Itsme: Multi-modal and unobtrusive behavioural user authentication for smartphones." In International Conference on Passwords, pp. 45-61, Cambridge, UK (Springer).

^[3] Buriro, Attaullah, Bruno Crispo, Filippo Del Frari, Jeffrey Klardie, and Konrad Wrona. "Itsme: Multi-modal and unobtrusive behavioural user authentication for smartphones." In International Conference on Passwords, pp. 45-61, Cambridge, UK.]

^[4] Buriro, Attaullah, Bruno Crispo, Filippo Delfrari, and Konrad Wrona. "Hold and sign: A novel behavioral biometrics for smartphone user authentication." In IEEE Security and Privacy Workshops (SPW), 2016, pp. 276-285, San Jose, CA, USA

^[5] Buriro, Attaullah, Bruno Crispo, Filippo Del Frari, and Konrad Wrona. "Touchstroke: smartphone user authentication based on touch-typing biometrics." In International Conference on Image Analysis and Processing, pp. 27-34, 2015.

Research Projects (continued)

- NeCS** ■ The project aimed at producing the highly qualified experts able to cope with all the aspects of the European cyber security strategy, and the challenges posed by cybersecurity and/or enhancing the human expertise in the field. We explored human aspects in cybersecurity and published these papers^{[6][7][8][9]} as the outcome of the project.
- SecurePhone** ■ The aim of the project was to secure the smartphones of the public, in general, and the top management, in particular. The market could not offer any solution which had to combine high security and usability. We researched, prototyped, and tested several innovative biometric-based solutions that were both highly secure and usable. In easy terms, the solutions exploited users interactions with the handset as behavioral biometrics. We published these listed papers^{[10][11][12][13]}, as outcome of the project.

Education

- Sep. 2022 - Dec. 2022 ■ **Data Science and Machine Learning: Making Data-Driven Decisions program**, MIT Institute for Data, Systems, and Society (IDSS).
- Nov. 2012 - Feb. 2017 ■ **PhD. (Information and Communication Technology)**, ICT Doctoral School, University of Trento, Italy.
Thesis title: *"Behavioral Biometrics for Smartphone User Authentication"*; available at <http://eprints-phd.biblio.unitn.it/1935/>.
During my PhD., I contributed on EIT-Digital's MobileShield & SecurePhone projects, European Training Network for Cyber Security project vide grant number 675320, and NATO Communication and Information Agency (NCIA) pilot project, namely, NATO Cybersecurity Incubator.
- Feb. 2008 – Dec. 2011 ■ **M.E. (Telecommunications)**, NED University of Engineering and Technology, Karachi.
- Feb. 1997 – Oct. 2001 ■ **B.E. (Electronics)**, Mehran University of Engineering and Technology, Jamshoro, Pakistan.

[6] Buriro, Attaullah, Zahid Akhtar, Bruno Crispo, and Sandeep Gupta. "Mobile biometrics: Towards a comprehensive evaluation methodology." In 2017 IEEE International Carnahan Conference on Security Technology (ICCST), pp. 1-6, 2017.

[7] Buriro, Attaullah, Bruno Crispo, Sandeep Gupta, and Filippo Del Frari. "DIALERAUTH: A Motion-assisted Touch-based Smartphone User Authentication Scheme." In Proceedings of the 8th ACM Conference on Data and Application Security and Privacy, pp. 267-276. ACM, 2018.

[8] Buriro, Attaullah, Rutger Van Acker, Bruno Crispo, and Athar Mahboob. "AirSign: A Gesture-Based Smartwatch User Authentication." In 2018 International Carnahan Conference on Security Technology (ICCST), pp. 1-5, 2018.

[9] Buriro, Attaullah, Bruno Crispo, and Mauro Conti. "AnswerAuth: A bimodal behavioral biometric-based user authentication scheme for smartphones." Journal of Information Security and Applications 44 (2019): 89-103.

[10] Buriro, Attaullah, Bruno Crispo, Filippo Delfrari, and Konrad Wrona. "Hold and sign: A novel behavioral biometrics for smartphone user authentication." In IEEE Security and Privacy Workshops (SPW), 2016, pp. 276-285, San Jose, CA, USA.

[11] Buriro, Attaullah, Sandeep Gupta, and Bruno Crispo. "Evaluation of Motion-based Touch-typing Biometrics for Online Banking", In 16th Conference of the Biometrics Special Interest Group (BioSig 2017), Darmstadt, Germany

[12] Buriro, Attaullah, Zahid Akhtar, Bruno Crispo, and Filippo Del Frari. "Age, gender and operating-hand estimation on smart mobile devices." In 15th International Conference of the Biometrics Special Interest Group (BIOSIG), pp. 1-5, 2016, Darmstadt, Germany.

[13] Buriro, Attaullah, Bruno Crispo, and Yury Zhauniarovich. "Please hold on: Unobtrusive user authentication using smartphone's built-in sensors." In IEEE International Conference on Identity, Security and Behavior Analysis (ISBA-2017), pp. 1-8, 2017.

Skills

Languages	■ Strong reading, writing, and speaking competencies for English, Urdu, Sindhi [C1 - Level certified].
Expertise	■ Machine Learning, Deep Learning, Numpy, Pandas, Keras, TensorFlow, Data Mining, Mobile Computing, Authentication
Scientific Applications.	■ Weka, Matlab, LaTeX, Eclipse, Scikit Learn, Anaconda.
Coding	■ Java, Python
Networking Simulators	■ Packet Tracer, Gns3, Boson Netsim.
Operating Systems	■ Windows XP, MS Windows Server 2003, Ubuntu, Android.
Office Applications	■ MS Word, Excel, Powerpoint, Access.

MOOC Certifications

- 2013 ■ **Learning From Data (introductory Machine Learning course)**, CaltechX/CS1156x/Fall2013, California Institute of Technology, through Edx, USA.
- 2014 ■ **More Data Mining With WEKA**, The University of Waikato, Hamilton, New Zealand.
- **Principles of Written English**, ColWri2.2x, University of California, Berkeley through edX, USA.
- **Understanding Research Methods**, University of London, through Coursera, London, UK.
- **Statistical Learning**, Stanford University, USA, through OpenEdX.

Publications (Google Scholar Citations = 657, H-index = 16)

- 2023 ■ [J13] David Massimo, Elias Ganthaler, **Attaullah Buriro**, Francesco Barile, Marco Moraschini, Anton Dignös, Thomas Villgrattner, Angelika Peer and Francesco Ricci: “*Estimation of Mass and Length of Sintered Workpieces using Predictive Models*”, IEEE Transactions on Instrumentation and Measurement (IEEE TIM), 2023. [Submitted]
- [J12] **Attaullah Buriro**, Abdul Baseer Buriro, Tahir Ahmad, Saifullah Buriro and Subhan Ullah: “*MALWD&C: A quick and accurate Machine Learning-based approach for Malware Detection and Categorization*”, Cryptography, 2023.
- [J11] Muhammad Haris Khan Abbasi, Subhan Ullah, Tahir Ahmad and **Attaullah Buriro**: “*A Real-Time Hybrid Approach to Combat In-Browser Cryptojacking Malware*”, Applied Sciences, Vol. 13, no. 4, pp.2039, 2023.
- [J10] Osama Khalid and Subhan Ullah and Tahir Ahmad and Saqib Saeed and Dina Alabbad and Mudassar Aslam and **Attaullah Buriro** and Rizwan Ahmad: “*An Insight into the Machine-Learning-Based Fileless Malware Detection*”, Sensors, Vol. 23, no. 2, pp. 612, 2023
- 2022 ■ [J9] Subhan Ullah, Tahir Ahmad, **Attaullah Buriro**, Nudrat Zara, and Sudipan Saha: “*TrojanDetector: A Multi-Layer Hybrid Approach for Trojan Detection in Android Applications*”, Applied Sciences, vol. 12, issue 21, pp.10755, 2022.

Publications (Google Scholar Citations = 657, H-index = 16) (continued)

- [C20] **Attaullah Buriro** and **Francesco Ricci**: “ClapAuth: A Gesture-based User-friendly Authentication Scheme to Access a Secure Infrastructure”, in proceedings of the International Workshop on Emerging Technologies for Authorization and Authentication (ETAA 2022), Copenhagen, Denmark.

- [C19] **Iustina Alekseevna Ivanova**, **Attaullah Buriro** and **Francesco Ricci**: “Map and Content-Based Climbing Recommender System”, In Adjunct Proceedings of the 30th ACM Conference on User Modeling, Adaptation and Personalization, pp. 41-45, Barcelona, Spain, <https://doi.org/10.1145/3511047.3536416>.

- 2021 ■ [J8] **Attaullah Buriro**, **Sandeep Gupta**, **Artsiom Yautsiukhin** and **Bruno Crispo**: “Risk-driven behavioral biometric-based one-shot-cum-continuous user authentication scheme”, *Journal of Signal Processing Systems* 93, no. 9 (2021): 989-1006, <https://doi.org/10.1007/s11265-021-01654-2>.

- [C18] **Attaullah Buriro**, **Francesco Ricci** and **Bruno Crispo** : “SwipeGAN: Swiping Data Augmentation Using Generative Adversarial Networks for Smartphone User Authentication”, in proceedings of the 3rd ACM Workshop on Wireless Security and Machine Learning (WiseML 2021), pp. 85-90, Abu Dhabi, UAE, <https://doi.org/10.1145/3468218.3469039>.

- [BC1] **Zahid Akhtar** and **Attaullah Buriro**: “Multitrait Selfie: Low-Cost Multimodal Smartphone User Authentication”, In *Biometric Identification Technologies Based on Modern Data Mining Methods*, pp. 159-175. Springer, https://doi.org/10.1007/978-3-030-48378-4_11.

- 2020 ■ [J7] **Sandeep Gupta**, **Attaullah Buriro** and **Bruno Crispo**: “A chimerical dataset combining physiological and behavioral biometric traits for reliable user authentication on smart devices and ecosystems”, *Data in brief* 28 (2020): 104924, <https://doi.org/10.1016/j.dib.2019.104924>.

- 2019 ■ [C16] **Bushra Mughal**, **Faheem Mushtaq** and **Attaullah Buriro**: “Classification of Breast Lesions in Combination with Metamorphic Segmentation and Saliency Feature Block”, in proceedings of the 2019 International Conference on Intelligent Technologies and Applications (INTAP 2019), pp. 573-580, Bahawalpur, Pakistan, https://doi.org/10.1007/978-981-15-5232-8_49.

- [C15] **Sandeep Gupta**, **Attaullah Buriro** and **Bruno Crispo**: “A risk-driven model to minimize the effects of human factors on smart devices”, in proceedings of the 2019 International Workshop on Emerging Technologies for Authorization and Authentication, pp. 156-170, 2019, https://doi.org/10.1007/978-3-030-39749-4_10, Luxembourg, Luxembourg.

- [J6] **Sandeep Gupta**, **Attaullah Buriro** and **Bruno Crispo**: “DriverAuth: A risk-based multi-modal biometric-based driver authentication scheme for ride-sharing platforms”, *Computers & Security* 83 (2019): 122-139, <https://doi.org/10.1016/j.cose.2019.01.007>.

Publications (Google Scholar Citations = 657, H-index = 16) (continued)

- [C14] **Sandeep Gupta, Attaullah Buriro and Bruno Crispo**: “*Smarthandle: A novel behavioral biometric-based authentication scheme for smart lock systems*”, in proceedings of the 2019 3rd International Conference on Biometric Engineering and Applications (ICBEA 2019), pp. 15-22, <https://doi.org/10.1145/3345336.3345344>.
- [J5] **Sandeep Gupta, Attaullah Buriro and Bruno Crispo**: “*DriverAuth: Behavioral biometric-based driver authentication mechanism for on-demand ride and ridesharing infrastructure*”, ICT Express 5, no. 1 (2019): 16-20, <https://doi.org/10.1016/j.icte.2018.01.010>.
- [J4] **Attaullah Buriro, Bruno Crispo and Mauro Conti**: “*AnswerAuth: A bimodal behavioral biometric-based user authentication scheme for smartphones*”, Journal of information security and applications (JISA) 44 (2019): 89-103, <https://doi.org/10.1016/j.jisa.2018.11.008>.
- [C13] **Muhammad Noman Riaz, Attaullah Buriro and Athar Mahboob**: “*The effect of software development project team structure on the process of knowledge sharing: an empirical study*”, in proceedings of the 2nd IEEE International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), pp. 1-5, doi: 10.1109/ICOMET.2019.8673504, Sukkur, Pakistan.
- 2018 ■ [J3] **Muhammad Noman Riaz, Attaullah Buriro, and Athar Mahboob**: “*Classification of attacks on wireless sensor networks: A survey*”, International Journal of Wireless and Microwave Technologies, 8(6), DOI: 10.5815/ijwmt.2018.06.02.
- [C12] **Attaullah Buriro, Rutger Van Acker, Bruno Crispo and Athar Mahboob**: “*AirSign: A Gesture-Based Smartwatch User Authentication*”, in proceedings of the 2018 International Carnahan Conference on Security Technology (ICCST), pp. 1-5, doi: 10.1109/CCST.2018.8585571, Montreal, Canada.
- [C11] **Attaullah Buriro, Bruno Crispo, Mojtaba Eskandri, Sandeep Gupta, Athar Mahboob and Rutger Van Acker**: “*SnapAuth: a gesture-based unobtrusive smartwatch user authentication scheme*”, in proceedings of the International Workshop on Emerging Technologies for Authorization and Authentication, Pages 30-37,, Barcelona, Spain, https://doi.org/10.1007/978-3-030-04372-8_3.
- [J2] **Muhammad Noman Riaz, Athar Mahboob and Attaullah Buriro**: “*Social success factors affecting implementation of agile software development methodologies in software industry of pakistan: an empirical study*”, International Journal of Advanced Computer Science and Applications 9, no. 7 (2018), DOI:10.14569/IJACSA.2018.090713.
- [C10] **Attaullah Buriro, Bruno Crispo, Sandeep Gupta and Filippo Del Frari**: “*DIALERAUTH: A Motion-assisted Touch-based Smartphone User Authentication Scheme*”, in proceedings of the 8th ACM Conference on Data and Application Security and Privacy (CODASPY 2018), March 2018 Pages 267–276, Tempe, AZ, USA, <https://doi.org/10.1145/3176258.3176318>.

Publications (Google Scholar Citations = 657, H-index = 16) (continued)

- [J1] **Sandeep Gupta, Attaullah Buriro and Bruno Crispo**: “Demystifying authentication concepts in smartphones: Ways and types to secure access”, *Mobile Information Systems* 2018 (2018), <https://doi.org/10.1155/2018/2649598>.
- 2017 ■ [C9] **Zahid Akhtar, Attaullah Buriro, Bruno Crispo and Tiago H. Falk**: “Multimodal smartphone user authentication using touchstroke, phone-movement and face patterns”, in proceedings of the 2017 IEEE Global Conference on Signal and Information Processing (GlobalSIP), pp. 1368-1372, doi: 10.1109/GlobalSIP.2017.8309185, Montreal, QC, Canada.
- [C8] **Attaullah Buriro, Zahid Akhtar, Bruno Crispo and Sandeep Gupta**: “Mobile biometrics: Towards a comprehensive evaluation methodology”, in proceedings of the 2017 International Carnahan Conference on Security Technology (ICCST), pp. 1-6, doi: 10.1109/CCST.2017.8167859, Madrid, Spain.
- [C7] **Attaullah Buriro, Sandeep Gupta and Bruno Crispo**: “Evaluation of Motion-Based Touch-Typing Biometrics for Online Banking”, in proceedings of the 2017 International Conference of the Biometrics Special Interest Group (BIOSIG), pp. 1-5, doi: 10.23919/BIOSIG.2017.8053504, Darmstadt, Germany.
- [C6] **Attaullah Buriro, Bruno Crispo and Yury. Zhauniarovich**: “Please hold on: Unobtrusive user authentication using smartphone’s built-in sensors”, in proceedings of the 2017 IEEE International Conference on Identity, Security and Behavior Analysis (ISBA), pp. 1-8, doi: 10.1109/ISBA.2017.7947684, New Delhi, India.
- 2016 ■ [C5] **Attaullah Buriro, Zahid Akhtar, Bruno Crispo and Filippo Del Frari**: “Age, gender and operating-hand estimation on smart mobile devices”, in proceedings of the 2016 IEEE International Conference of the Biometrics Special Interest Group (BIOSIG), pp. 1-5, Darmstadt, Germany.
- [C4] **Attaullah Buriro, Bruno Crispo, Filippo Del Frari and Konrad Wrona**: “Hold and Sign: A Novel Behavioral Biometrics for Smartphone User Authentication”, in proceedings of the 2016 IEEE Security and Privacy Workshops (SPW), pp. 276-285, doi: 10.1109/SPW.2016.20, San Jose, CA, USA.
- 2015 ■ [C3] **Attaullah Buriro, Bruno Crispo, Filippo Del Frari, Jeffrey Klardie and Konrad Wrona**: “ITSME: Multi-modal and Unobtrusive Behavioural User Authentication for Smartphones”, in proceedings of the International conference on passwords, pp. 45-61, pp. 45-61, Cambridge, UK.
- [C2] **Attaullah Buriro, Bruno Crispo, Filippo Del Frari and Konrad Wrona**: “Touch-stroke: Smartphone user authentication based on touch-typing biometrics”, in proceedings of the International Conference on Image Analysis and Processing – ICIAP 2015 Workshops, pp. 27-34, https://doi.org/10.1007/978-3-319-23222-5_4, Genoa, Italy.
- 2011 ■ [C1] **Rizwan Aslam Butt and Attaullah Buriro**: “Secure lan management with snmpv2 over ipsec”, in proceedings of the 2011 6th IEEE International Conference on Telecommunication Systems, Services, and Applications (TSSA), pp. 271-274, Denpasar, Indonesia.

Selected Tutorials / Presentations










- 2022 ■ **Behavioral Biometrics-based identity verification for new generation devices**, SFScon, NOI Tech park, 12th Nov. 2022, Bolzan, Italy.
- **ClapAuth: A Gesture-based User- friendly Authentication Scheme to Access a Secure Infrastructure**, 5th International Workshop on Emerging Technologies for Authorization and Authentication (ETAA 2022), 30th Sep. 2022, Copenhagen, Denmark.
- **Behavioral Biometrics - a new form of identity verification - a Tutorial**, 8th International Summer School on Software Engineering July 4-6, 2022 Bolzano, Italy, <https://seschool-series.github.io/2022/>.
- **On the use of *Biometrics* and *Cryptography* in vehicles**, KICK OFF: CYBERSECURITY ROUNDTABLE, Automotive Excellence Sudtirol, Bolzano-Bozen, Italy, <https://www.automotive-suedtiroel.com/eventsandworkshops/event-five-t2hr2>. Blog: <https://www.automotive-suedtiroel.com/blog>
- 2021 ■ **SwipeGAN: Swiping Data Augmentation using Generative Adversarial Networks for Smartphone User Authentication**, 3rd International ACM Workshop on wireless security and machine learning (ACM WISEML, Co-Located with WISEC 2021), Abu Dhabi, UAE.
- 2018 ■ **SNAPAUTH: A Gesture-based Unobtrusive Smartwatch User Authentication Scheme**, 1st International Workshop on Emerging Technologies for Authorization and Authentication (Co-Located with ESORICS 2018), Barcellona, Spain.
- 2017 ■ **Mobile Biometrics: Towards A Comprehensive Evaluation Methodology**, The 51st International Carnahan Conference on Security Technology (ICCST-2017), Madrid, Spain.
- **Behavioral Biometrics for Smartphone User Authentication**, PhD Dissertation Defence, University of Trento, Italy.
- 2016 ■ **Age, Gender, and Operating-hand Estimation on Smart Mobile Devices**, 15th International Conference of the Biometrics Special Interest Group (BIOSIG), Germany.
- 2015 ■ **Behavioral Biometrics for Smartphone User Authentication**, The Data Economy in Privacy, Security & Trust, organized by EIT Digital, at Milan Expo 2015, Italy.
- **Touchstroke:Touch-typing Biometrics for Smartphone User Authentication**, International Workshop on Recent Advances in Digital Security: Biometrics and Forensics, Genova, Italy.
- **Introduction to Behavioral Biometrics, User Authentication Schemes on Smartphones, Security Evaluation of Behavioral Biometrics**, International Cyber Security Summer School, organized by NATO Communications and Information Agency (NCIA), The Hague, Netherlands.
- 2013 ■ **Arm Movement Biometrics for Smartphone User Authentication**, 11th International Summer School for Advance Studies on Biometrics for Secure Authentication, Alghero, Italy.

Reviewer of Journals & Conferences





Jul. 2016 ■ **IEEE Access**, <http://ieeaccess.ieee.org/>.

Dec. 2016 ■ **Neural Computing and Applications (NCAA)**, <http://www.springer.com/computer/ai/journal/521>.

Reviewer of Journals & Conferences (continued)


- Jan. 2018  **Journal of Engineering & Technology (JAES)**, <https://journals.uetjournals.com/index.php/JEAS>.
- Mar. 2018  **KSII Transactions on Internet and Information Systems**, <http://www.itiis.org/>.
- Apr. 2018  **Sensors**, <http://www.mdpi.com/journal/Sensors/>.
- Jun. 2018  **IEEE Transactions on Mobile Computing**, <https://www.computer.org/web/tmc>
- Jul. 2018  **Computer Standards & Interfaces**, <https://www.journals.elsevier.com/computer-standards-and-interfaces>
- Oct. 2018  **IEEE Transactions on Biometrics, Behavior, and Identity Science**, <http://tbiom.ieee-biometrics.org/>
- Dec. 2018  **Mehran University Research Journal of Engineering & Technology**, <http://publications.muet.edu.pk/index.php/muetrj>
- Aug. 2019  **ACM CHI Conference on Human Factors in Computing Systems**, <https://chi2020.acm.org/>
- April. 2018  **IEEE IAPR International Conference on Biometrics**, <https://icb2018.org/>

Students Supervised

- Feb. 2022 - June. 2022  **Mwaita Kevin Fred**, Faculty of Computer Science, M.S Computational Data Science (Graduation: June. 2022), Thesis title: *“Real Time Gesture-Based Authentication and Command Extraction Application for Smart Devices”*, <https://www.linkedin.com/in/kevin-f-6706041aa/>
- Mar. 2021 - Mar. 2022  **Rene Zorzi**, Faculty of Computer Science, Free University of Bozen-Bolzano, Bolzano, B.S (Graduation: Mar. 2022), Thesis title: *“Sign Language Based Gesture Recognition using Video and Smartwatch Sensors”*
- Mar. 2018 - Aug. 2019  **Mohammad Noman Riaz**, Department of Software Engineering, Virtual University of Pakistan, Islamabad, Pakistan, M.S (Graduation: Aug. 2019), Thesis title: *“Factors affecting transition time between capability maturity model integration in software industry of Pakistan: An Empirical Study”*, <https://www.linkedin.com/in/engr-muhammad-noman-riaz-436a60113/>
- Jul. 2016 - Mar. 2017  **Getachew De. Abebe**^[14], DISI, University of Trento, Italy, M.Sc (Graduation: Mar. 2017). Thesis title: *“Implementation and Experimental Validation of a Multimodal Behavioral Biometrics for Smartphone User Authentication”*, <https://www.linkedin.com/in/getachew-d-abebe-b70a78b6/>

^[14]Co-supervised (with Prof. Bruno Crispo)

Students Supervised (continued)

Feb. 2017 - Aug. 2017  **Rutger Van Acker**^[15], Department of Computer Science, Catholic University of Leuven, Leuven, Belgium, M.Sc (Graduation: Aug. 2017), Thesis title: “*Gesture-based authentication for smartphones using Wearable devices*”, <https://www.linkedin.com/in/rutger-van-acker-a5b786108/>

Reference

Available on demand

^[15]Co-supervised (with Prof. Bruno Crispo)