

Secure Societies 2024: Horizon Europe Cluster 3 Brokerage Event in Istanbul Pitch Presentation Template

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SECURE-BIO

Security Enhancement and Countermeasure Utilization for
Risk Elimination - Biometric Identification Optimization

Contact Details

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Proposal activity: *Advanced user-friendly,
compatible, secure identity and travel
document management* [HORIZON-CL3-2024-
BM-01-03](#)



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Description of the Organization



YTU Department of Electronics and Communication Engineering

Machine Intelligence and Design Automation Lab (2010)

High performance computers
4 Phd, 8 MSc and 8 Undergrad students.
Subjects: Image Processing, Computer Vision,
Deep Learning, Neural Networks

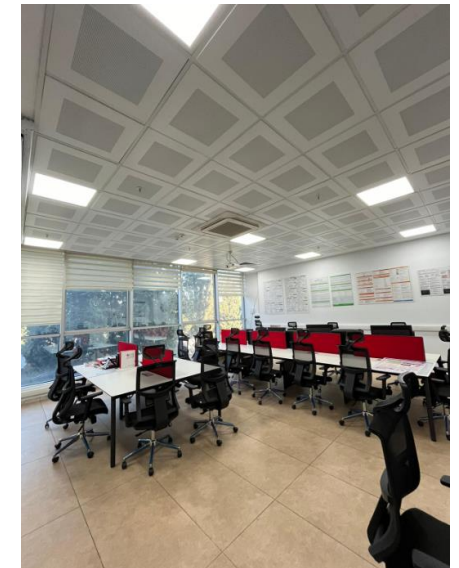


Cyber Security and Biometric Research Lab. (2015)

- Biometric sensors (Iris, face cameras; finger print sensors, touchless sensors, audio sensors....)
- Biometric recognition, (face, fingerprint, signature...)
- Liveness detection, fraud attacks solutions

Interdisciplinary AI Solutions Lab (2023)

Physics
Maths
Aerospace
Defence
Medical



Projects and Some Journal Papers Related to Subject

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Projects related to the subject

Smart Building Sensitive to Daily Sentiment- SUSTAIN,

HORIZON-EIC-2021-PATHFINDER CHALLENGE,

<https://cordis.europa.eu/project/id/101071179>

Flight Anomaly Detection in Unmanned Aerial Vehicles with Hybrid Deep Learning Method

Project Supported by Higher Education Institutions, YTU, Director: **NİHAN KAHRAMAN**, Researcher: MURAT TAŞKIRAN, Researcher: H. VILDAN DUDUKCU N. (2021-2023)

Liveness Detection in Face Recognition Software Development, Industry TUBITAK Project, Director: NİHAN KAHRAMAN, Researcher: MURAT TAŞKIRAN (2021-2022)

Extraction of Soft Biometric Data from Multimodal Natural Facial Expression Videos, -TUBITAK (The Scientific and Technological Research Council of Turkey) 1001, Director: EROĞLU ERDEM ÇİĞDEM, **Researcher: KAHRAMAN NİHAN**, Scholar: TAŞKIRAN MURAT, 27/03/2018 - 26/10/2020

Implementation of a General Purpose Artificial Neural Network with Hybrid Hardware, -TUBITAK 1001, Director: TÜLAY YILDIRIM, Researcher: BURCU ERKMEN, Researcher: REVNA ACAR VURAL, **Researcher: NİHAN KAHRAMAN**, Researcher: MUTLU AVCI, , 01/08/2005 - 01/ 08/2008

Intelligent Tracking System with Image Processing Techniques for Unmanned Aerial Vehicles, TÜBİTAK PROJECT, Director: Ünalı H Semih, **Supervisor: KAHRAMAN NİHAN**, 01/03/2014 - 20/08/2014 (Student Project Supported by TUBITAK)

Security Event Records Anomaly Analysis Module, YTU, **Director: NİHAN KAHRAMAN**, Researcher: MURAT TAŞKIRAN, Researcher: H. VILDAN DUDUKCU



Journal papers and conferences related to subject;

M. Aydin, M. Taskiran, N. Kahraman and H. V. Dudukcu, "**A Fusion-Based Deep Neural Networks Approach for Face Liveness Detection**," 2023 International Conference on Innovations in Intelligent Systems and Applications (INISTA), Hammamet, Tunisia, 2023, pp. 1-6

SADAK MUSTAFA SEMİH, KAHRAMAN NİHAN, ULUDAĞ UMUT, **Dynamic and static feature fusion for increased accuracy in signature verification**, SIGNAL PROCESSING-IMAGE COMMUNICATION, cilt.108, 2022

GÜNEY HANİFE, AYDIN MELEK, TAŞKIRAN MURAT, KAHRAMAN NİHAN (2021). **A deep neural network based toddler tracking system**. Concurrency and Computation: Practice and Experience, Doi: 10.1002/cpe.6636

TAŞKIRAN MURAT, KAHRAMAN NİHAN, EROĞLU ERDEM ÇİĞDEM (2021). **Hybrid face recognition under adverse conditions using appearance** based and dynamic features of smile expression. IET Biometrics, 10(1), 99-115., Doi: 10.1049/bme2.12006

TAŞKIRAN MURAT, KAHRAMAN NİHAN, EROĞLU ERDEM ÇİĞDEM (2020). **Face recognition: Past, present and future (a review)**. Digital Signal Processing, 106

KAHRAMAN NİHAN, ÇAM TAŞKIRAN ZEHRA GÜLRU, TAŞKIRAN MURAT (2018). Novel Feature Extraction Methodology with Evaluation in Artificial Neural Networks Based Fingerprint Recognition System. Tehnicki vjesnik - Technical Gazette, 25(Supplement 1), 112-119.

Expertise Offer as a Partner

Specific skills and proposed activities related to the topic

- Anomaly detection (fraud)
- Identity Security
- Identity Authentication and Management. Udentify is a product of this type, it is used as a customer onboarding solution by Türkiye İş Bankası (largest private bank in Türkiye), Fibabanka and Getir
- Development of verification tools for international standards
- Expertise in face anti-spoofing will help provide document authenticity development
- Expertise in fraud detection in both machine learning and rule-based systems
- Data anonymization capabilities
- Large scale Document indexing, fuzzy text searching, and vector searching capabilities
- Penetration testing and static code security analysis

Past experience related to the topic (related projects, articles, etc.)

- Udentify is an Identity Authentication and Management product. It has mobile SDKs and applications, can act as a biometric central authenticator, comply with ICAO MRTD standards, actively manage transactions of identity verification, search for vectorized identities, integrate with web sites, internal api's or integrate as an SDK in other mobile platforms
- Project: «ADTS (Smart and Learnable Fraud Detection System)» Currently aiReflex, capable of detecting both application and transactional fraud. National funded project
- Project: «Liveness Detection in Face Recognition Systems» for detecting face anti-spoofing attacks. National funded project

Mitigating new threats and adapting investigation strategies in the era of Internet of Things HORIZON-CL3-2024-FCT-01-01

- Modern information analysis for Police Authorities, allowing them to efficiently fight criminals and terrorists who use novel technologies;
- Improved forensics and lawful evidence collection, increasing the capabilities to apprehend criminals and terrorists and bring them to the court

Accelerating uptake through open proposals for advanced SME innovation HORIZON-CL3-2024-SSRI-01-02

Option A: Some examples of domains that could be addressed under the FCT area are: (indicative and non-exhaustive): mobile forensics; deepfake detection; detection of counterfeiting (fake items, fake currency bills) or of falsified/forged documents (passports, ID cards); detection and countering of advanced forms of malware, as well as non-cash payment frauds and other cyber crimes

Proposal idea/content

Objectives



Develop Advanced Biometric Identification Techniques

Implement Liveness Analysis Algorithms

Integrate Security Countermeasures

Enhance User-Friendly Interfaces

Ensure Compatibility and Interoperability

Conduct Comprehensive Testing and Evaluation

Address Privacy and Ethical Considerations

Provide Training and Support

Collaborate with Stakeholders

Promote Public Awareness and Trust

Deliverables

Biometric Identification System Prototype

Liveliness Analysis Algorithms

Integrated Security Countermeasures

User-Friendly Interfaces

Compatibility and Interoperability Solutions

Testing and Evaluation Reports

Privacy and Ethical Guidelines

Training Materials and Documentation

Collaboration Agreements and Partnerships

Public Awareness Campaigns



Project participants

Existing Consortium - profile of known partners (if any)

No	Partner Name	Type	Country	Role in the Project
01	YTU	University	Türkiye	Project Coordinator, Secure Authentication
02	fraud.com	SME	England	Partner, Face Fraud Detection
03	İHS Technology	SME	Türkiye	Partner, Data anonymization
04				
05				
06				
07				

Project participants

Consortium – required partners

No	Expertise	Type	Country	Role in the project
01		Public Authority		End User
02		Public Service Provider		Airport or border integrity
03				
04				
05				
06				