

3D Face Project

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Overview

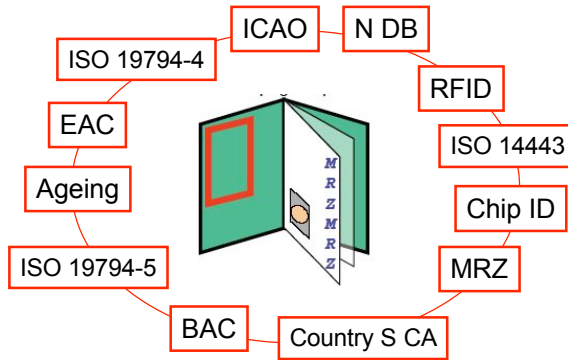
- Background
- Objectives
- Workpackages

Biometrics and Border Control

■ Biometric ePassport



- EU-Council Regulation No 2252/2004 - of 13 December 2004 on standards for security features and biometrics in passports and travel documents



Border control



UNITED KINGDOM:

BORDER CONTROL - IRIS



AUSTRALIA:

BORDER CONTROL - SMARTGATE



■ Biometrics well accepted by operator and citizens if it provides:

- ▲ Security and trust
- ▲ Efficient
- ▲ Comfort



FRANCE: BORDER CONTROL - PEGASE



FRANCE / BELGIUM VISA PILOT - BioDev

Border Control Systems



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Existing application with 2D facial

- SmartGate - Kiosk
 - Verification against template on Passport



State of the Art

- **Performance depends on many factors**

- Quality of the capture device
- Quality of the algorithms
- Cooperation of the user
- Environment factors



- **Typical ranges of performances for the three main biometric technologies**

Technology	Fingerprint	Iris	Face
FTE	0.1%	1-2%	0%
FA	0.01%	0.0001%	1.00%
FR	0.5%	2%	2-10%

Authentication (1:1)



Need for robustness

- Authentication with ePassport and
 - 2D Face-Recognition
 - Fingerprint-Recognition
- 2D face recognition does not provide any robust mechanisms, to allow liveness detection
- ICAO - RFI 10'2004:
 - "... new technologies is now sought ... Technologies and processes that are suitable for **automated self-identification** at international borders that will enable **unattended** border crossing"



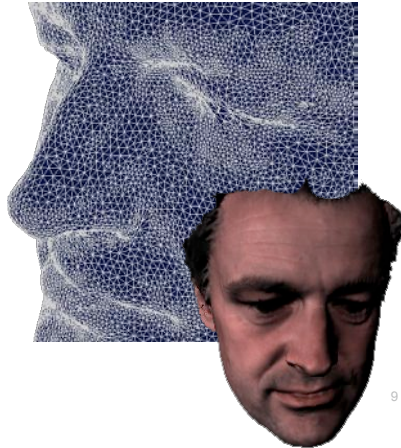
Unattended border crossing can only be achieved, if additional (biometric) characteristics are observed



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3D Face Recognition approach

- 3D face scanning
 - Observation of the texture (Image information)
and the shape (Geometry)
- Multimodal Analysis
 - Link different information channels



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The 3D Face Project

- Integrated Project (026845)
 - 36 month project started April 2006
 - Research on 3D facial recognition to address needs of airports for processing biometric passports
- Consortium of 12 partners
 - Industry (Bundesdruckerei, Philips, Sagem, L1-Viisage)
 - SMEs (Cognitec, Polygon)
 - Research Centres (Fraunhofer-IGD, CGC)
 - Universities (Kent, Napoli, Twente,)
 - Berlin Airport
 - 3 additional end-users to join the project soon: BKA, JRC and Salzburg Airport

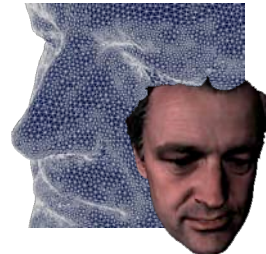
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Project Objectives

- Explore multimodal facial data
 - 3D, 3D+2D
 - Face texture
 - Multiple algorithms
- Improve biometric performance
 - FAR < 0.25%, FRR < 2.5%
 - Internal competition of labs
 - Selection of best results by independent evaluation



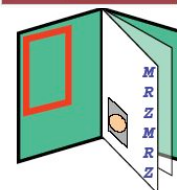
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Project Objectives (cont.)

- Template Protection
 - Highest degree of privacy protection
- Validation at airports
 - Operational performance
 - Social and operational issues
- Standardization
 - Direct influence on international standards



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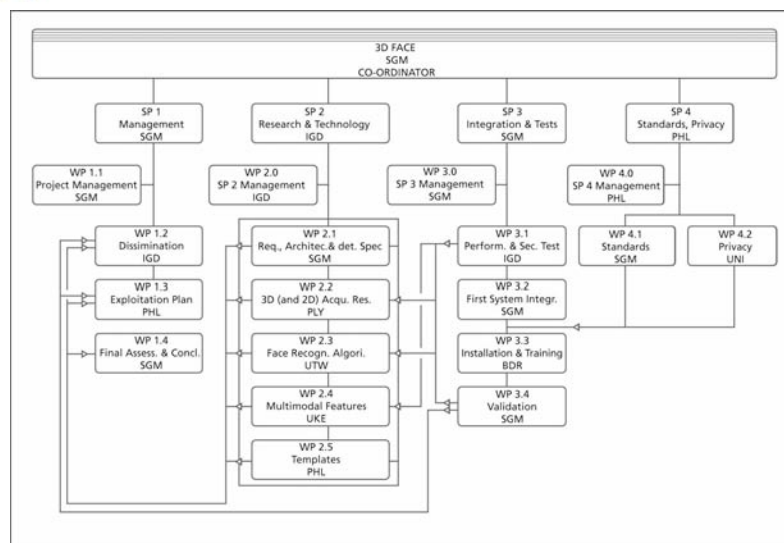
Technical goals 3D Face Project

- Develop existing approaches to **full operational 3D face recognition technology** with **higher biometric performance** (3D vs. 2D)
- Realize **multimodal feature analysis** (surface metrics combined with texture metrics).
- **Prove performance improvements** with technology testing and scenario testing programs.
- Research towards **fake resistance** to allow technology for use at critical infrastructure installation.
- Develop compact coding **format for 3D face template** and submit format to the **standardization body** (ISO/IEC JTC1 SC37 WG3)
- Be **backwards compliant** to existing installations (older Passports with 2D template)
- Explore an **innovative** approach for the **protection of privacy**, through the design of biometric template protection
- Bring technology to a level where it **can be used operationally at airports**

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Organisation of the project



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Status / progress of the project

- Original schedule is met
- A 3D sensor mock-up is available
- Some issue solved for data collection (regulation)
- Some first lab results
 - 3D sensors overview
 - Faking scenarios
 - 3D face recognition
 - Face texture
 - Fusion
 - Template protection
- Challenge is now to reach the target results and demonstrate the efficiency on the field with end-users

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More Information

- More Information on the project is available at:
<http://www.3dface.org>



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