Federal Ministry
Republic of Austria
Transport, Innovation
and Technology

KIRAS
Security Research

Modelling and Simulation in Security Research
## The Austrian Experience

NATO MODELLING & SIMULATION GROUP (NMSG), 24/25 October 2019, Vienna

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Staff Group for Technology Transfer and Security Research

Who we are:
BMVIT in a nutshell

✓ BMVIT = The Austrian Federal Ministry for Transport, Innovation and Technology

✓ responsible for **applied research and technology development funding**

✓ responsible for **70% of public business-related R&D funding** in Austria

✓ annual budget of **500 mio €**

✓ we put an emphasis in research & technology development in six main areas, which also correspond with the Austrian strengths in technology areas:

  - Smart Mobility, Smart Energy, ICT, Production & Advanced Materials as well as

   two governmental led areas: Space **and Security**

The wider picture:
The „Safety Pin"- Two programs, one mission
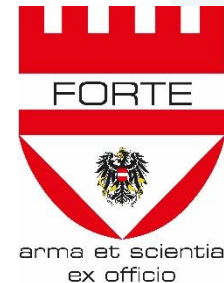
✓ To support (primarily) Austrian companies and research institutions in the research and development of new technologies and the creation of the necessary knowledge to increase the security of Austria and to generate added value.

✓ To concentrate all federal security research funding in the civil security research programme KIRAS and the defense research programme FORTE to maximize efficiency and minimize processing costs

✓ To guarantee a meaningful but flexible budget (€14m f. 2019), which is split between the programs every year depending on priorities.

KIRAS –

Comprehensive Approach of Security Research in Austria

➢ Based on a broad, circumspect notion of security ("Security – **not** Safety")

➢ Due consideration of the developments on the European level (Complementarity of national programmes)

➢ Integration of all relevant actors and stakeholders (identifying the community, connecting the security research stakeholders)

➢ Due consideration of socio-political and cultural aspects („societal dimension") already during the setup of the programme

➢ Thematic emphasis on „Critical Infrastructure Protection"

➢ Civil focus → dual use

Implementation in Austria
KIRAS – Mode of Operation

✓ **The BMVIT is the programme owner and funding authority of KIRAS**

✓ **Strategic coordination** takes place within the framework of a **steering committee** consisting of all ministries and stakeholders relevant for security research (Federal Chancellery, MoI, MoD, BMVIT, Scientific Council, Social Partners, etc.)

✓ **KIRAS programme-management** is provided by the Austrian Research Promotion Agency (**FFG)**

✓ For the actual calls, **various FFG-financing instruments** are employed for **funding up to TRL 6+ with rates of up to 85% (exception: Instrument F & E-DL: 100% financing)**

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KIRAS – Specifics

➢ KIRAS was the first national security research programme within the EU (starting 2005). Because of Austria's spearheading role the programme's strategic principles were over time more or less fully implemented into the European security research programme (ESRP)

➢ Mandatory inclusion of end-users = end-user participation in every project; accomplished goal: no research without demand

➢ Mandatory confirmation of additionally created or secured jobs as knock-out criterion

➢ Mandatory inclusion of humanities, social sciences and cultural studies (HSC*) in every project = maximized societal consent for projects, no ex-post political debates despite the sensibility of the topic

* *The humanities, social sciences and cultural studies. HSC are all scientific disciplines which refer to society or parts of society.*

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KIRAS-Funding and Figures

Number of Calls 2006-2018	29
Number of submitted projects	670
Number of approved/funded projects	254
Ratio approved/funded to dismissed projects	~ 1 : 3
Total project costs	~ 121 M €
Total funding	~ 85 M €

Economic effects measured until the December 2018:
- Approx. 166 M € added-value induced by 85 M € funding value.
- Employment effects: over 3000 jobs created or maintained.

Security Research – Project Result based Focus Areas

✓ C4 – Situational awareness and operation command/decision support

✓ CP-CIP – Cyber/physical critical infrastructure protection

✓ Smart surveillance

✓ Airborne multi-sensor systems/platforms (e.g. for wild-fire, flooding and people observation)

✓ Security at mass gatherings and protection of crowds

✓ Semi- and fully autonomous vehicle systems

✓ Border and airport security (i.e. ABC gates/checkpoints, mobile registration equipment)

✓ Cyber security

✓ OSINT (including counter-radicalisation and migration flow efforts)

✓ Risk- and threat analyses (e.g. cascading effects of power "blackouts")

✓ HSC focussed research on "Security and Society" incl. LEA training and "resilience" of citizens against natural and man-made hazards

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KIRAS-Projects related to Simulation & Modelling

➢ **DIGEX** – Simulation of the threat and damage potential of explosive devices at the urban level

➢ **EVES –** Evaluation system for the optimization of evacuation scenarios and intervention strategies of emergency services

➢ **SCUDO** – Development & testing of an optimized simulation process for public / private information exchange in the case of complex cyber security incidents tailored to Austrian companies

➢ **EN MASSE/MONITOR** – Modelling optimal first responder deployment during mass events by human behaviour analysis and simulation based prediction to detect critical situations

➢ **FlashBang** – Simulator creation base upon in situ risk assessment of the acoustic impact of stun grenades

➢ **Parsifal/Polis** – Modelling of solutions and competence strategies for Police training regarding typical situations on selected societal Hot Spots in Austrian cities

➢ **CERBERUS** – Novel theoretical models for the risk management of interdependent real-world critical infrastructure objects at risk of cascading effects

➢ **Energy Risks in Cities** – Fundamental risk analysis regarding the different energy grids (natural gas, electricity, district heating) in Austrian cities via quantitative modelling and scenario analysis

➢ **CPS –Security –** Anomaly detection in industrial Control / SCADA systems by comparing a simulation of the predicted formalized behavioural model with the actual measured data from the operational plant.

➢ **Energiezelle F** – Modelling a regional energy-cell- and crisis situation ("blackout") for the development of a preparedness concept

* For more detailed information on the projects follow http://www.kiras.at/gefoerderte-projekte/en

Common features of civil security simulation / modelling efforts in Austria

- Hands on (as physical and realistic as possible)

- Project based funding (often leads to one-time events)

- Focused on specific scenarios / challenges

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A Novel Field for Funding –
Security Research Simulation and Modeling Infrastructure

➢ **Subterranean Special Forces Research & Training Center - SSF-RTC** at Erzberg Leoben

"A unique Special Forces training ground for realistic training of counter-terrorism subterranean scenarios (railway tunnel, car tunnel and adaptable metro station) deep within the Austrian Alps. Status: in preparation."
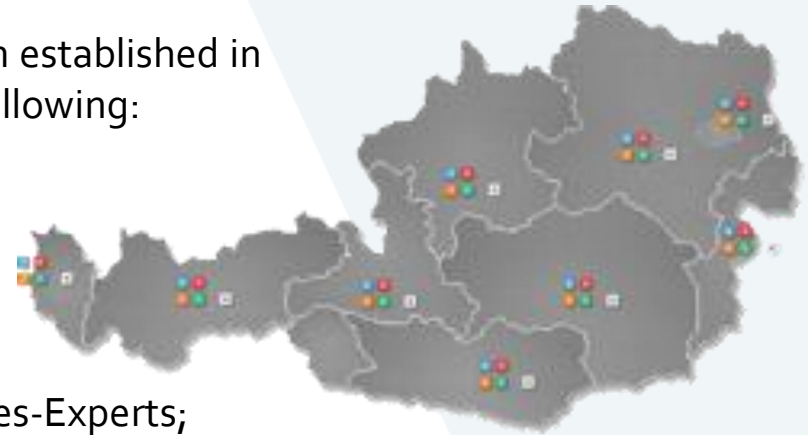
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Out of the Box:

New Simulation Proposals – Interesting Scenarios

- **Kobayashi Maru Test** - How to deal with a complete failure scenario, where you don't stand a chance of winning?

- **Lights out, Com down Test** – All powered systems fail, how to adapt to a purely physical world in an instant?

- **Man or obstacle in the loop Test** – How effective/realistic can the inclusion of a human decision-maker be in the age of full automatic engagement?

- **The all too thin layer of civilization** – Testing ground for citizens for comparing their actual lifestyle with a disruptive emergency situation (breakdown of everyday supply system)

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Online Security Research Map KIRAS

The Online Security Research Map KIRAS has been established in
December 2009 by the BMVIT for the purpose of allowing:

➢ End-users (= MoI, MoD, provincial authorities,
 first responders, critical infrastructure operators);
➢ Researchers;
➢ Businesses;
➢ Humanities, Social Sciences and Cultural Studies-Experts;

to project their respective demands and capabilities on this
website thus facilitating the creation of consortia for KIRAS-projects. Thanks
to the intuitive setup of the map, over 500 Institutions have enlisted to this free of charge show
case.

Link: http://landkarte.kiras.at/ or via KIRAS-Main Page www.kiras.at

<u>Safety Pin – Contact</u>

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