A Man-in-the-Loop Support Concept for Military Ambush Threat – Assessment Based on Reconnaissance Reports

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ABSTRACT

On all levels of the military command hierarchy there is a general and strong demand for support by automated processing of reconnaissance reports. This is especially required for information processing and situation assessment, which aims at the inference and deduction process on the base of report information to the greatest possible extend by analysis components. Developments for computer based decision support significantly expands the capability of tactical situation display programs.

Regarding this general background, some methodical preconditions for the improvement of computer support are characterized. The central aspect is the role of the information context for an appropriate perception of the situation by the analysis of reports. This is illustrated by a specific military example of an ambush attack situation, which has the proprietary feature of disguised preparation. The example is representing an unconventional type of military operations, which are complex in prearrangement and typically clandestine in accomplishment. Their timely recognition by HUMINT information is a task, which is mandatory dependent on expertise. Our concept for the threat assessment is therefore developed on a two-stage man–in-the-loop procedure still dependant on this expertise. Its benefit lies in the ruthless incorporation of absent, but possibly significant situation context information on a trial-and-error base. The major ideas were tested by an ability assessment tool for ambush attacks. The results are discussed.

Keywords: *Knowledge-Based Information Fusion, Situation Assessment, Intelligence Preparation of the Battlefield (IPB), Command and Control, Military Scenario Simulation, Operations Other Than War (OOTW).*

1.0 INTRODUCTION

The computer assisted processing of incoming military reports is done in the first instance by theatre independent analysis. For the merging of information belonging to the same object or state of an object we need a series of regulations. Since this is not a simple one-to-one aggregation, we need to invent methods of higher level abstraction. We call these methods together with the underlying regulations the fusion process. The aggregation and fusion of information which are often incomplete, misleading and/or untimely in their content is a difficult task. These follow up processing steps can now only be accomplished on the base of background knowledge and with regards to the specific situation context. The rules for the information processing are given by a priori data. Templates are defined by recurring patterns of human behaviour and military default operations. Case studies, lessons learned and expertise establish the base for the definition of such a template for the example of a military ambush situation. The practicability of this template is illustrated with an isolated example of an ambush attack situation as a part of a comprehensive military scenario for Bosnia and Hercegovina which was developed in accordance

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with the guidelines from [6]. The experimental analysis of this example starts with considerations of vulnerable objects and structures and explains which kind of information are the precondition for awareness using our template-based concept.

Section 2 gives a brief introduction to the information fusion topic as it is considered for the example of this paper. Fundamental constituent terms like information, situation assessment, situation context, information modelling, databases and templates are outlined. Section 3 touches one of the most important prerequisites, that military operations are determined by rules, doctrines and default behaviour. In section 4 the elements of a specific observation situation are introduced, like the scenario frame, experimental details, the report situation and some knowledge base data examples are given. Some preliminary testing results for the example of a non-conventional military ambush situation are discussed in section 5. The conclusions for this concept so far are recapitulated in section 6. Section 7 gives the references for major work used in this study.

2.0 INFORMATION FUSION

The processing model for data fusion which was developed by the Joint Directors of Laboratories (JDL) Data Fusion Subpanel (DFS) provides a framework and common reference for addressing data fusion issues and problems [31]. Though different models and concepts are existing, like [7] (Boyd Control or Observe, Orient, Decide and Act – OODA Model), [26] (Intelligence Cycle), [1] (Waterfall Model), [28] (Revised JDL Data Fusion Model), [2] (Omnibus Model) or [25] (Extended OODA Model), to name just a selection of most influencing works on this topics. A brief overview was given by [11] recently. The following roughly grouping is still valid:

- Level 1 Fusion: Fused position, and time-stamped identity estimates
- Level 2 Fusion: Hostile or friendly military situation assessment
- Level 3 Fusion: Hostile force threat assessment

These levels are not architectural aspects of computing, they focus on an inferential hierarchy as the process moves from Level 1 to Level 3. In this paper we discuss a concept to obtain intelligence products from report processing of an example study of a non-conventional military operation. From the scope of the Intelligence Cycle (IC) defined by the NATO Glossary of Terms and Definitions (AAP-6) we focus on the phase of the *Processing of Intelligence.*

This example study is a sequel to the work on knowledge-based data fusion on templates for a classical conventional military scenario [3], [4], [13], [14]. The aim of the work is, to show the benefits of comprehensive a priori situation analysis which is the base for the creation of suitable templates for timely awareness of hostile operations, facing imperfect information. Military expert knowledge is the base for the information fusion, but the systematic incorporation of missing or weak information as elastic constraints is the ultimate strength of a computer support tool, which is in accord with template-based information fusion. There we see the key for a necessary problem solving technique for threat assessment.

This is the underlying idea for the man-in-the-loop concept. The incoming semantically pre-processed information is, depending on its content, allocated either to the processing steps of the *capability oriented analysis* (in the case of a ‘static’ content) or the *ability oriented analysis* (in the case of a ‘dynamic’ type). The difference between a static or a dynamic information is explained in details in a later paragraph. After the level one processing of these information (Section I and II in Fig. 1.) we obtain the input elements for situation assessment on templates, which of course will be incomplete in terms of the whole set of possible entries to a template. If not incomplete, it will at least not cover all aspects with respect to a *Ground Truth.* In spite of that we try pattern matching for subsets of predefined templates for specific situation assessment tasks. An example for that could be e.g. a template for an ambush attack threat.

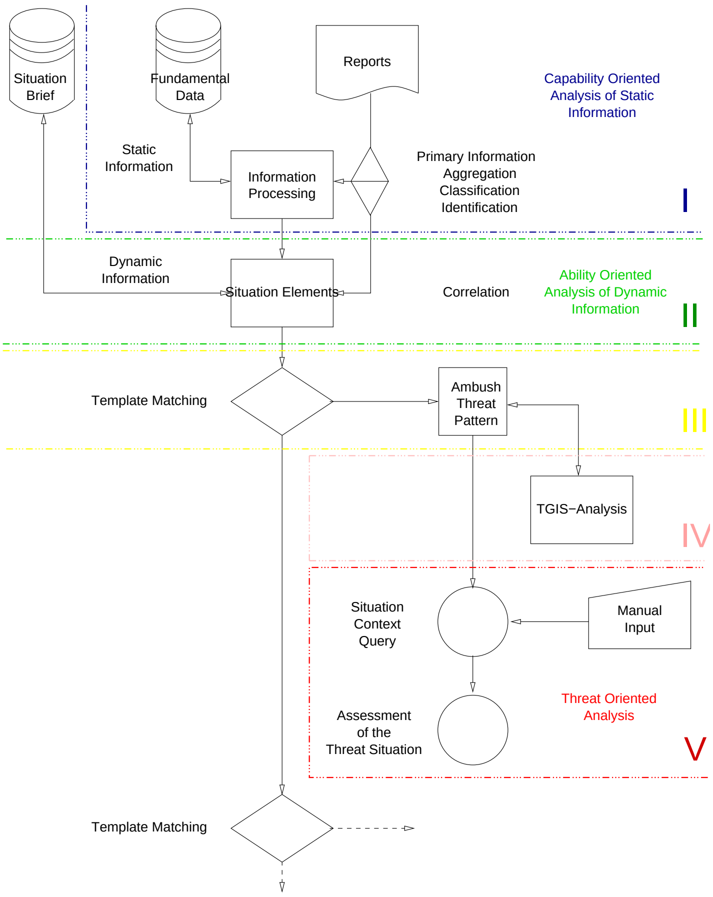

Figure 1: Scheme of the man-in-the-loop support concept.

2.1 Information in Reports

In our simplified scenario driven study we focus on incorporation of not explicitly stated situation context dependent information into the process of information fusion. Reasons for that could be e.g. low observability of objects, minor detection-discrimination capabilities or behavioural deception, to name just a few. The practically important report processing is not within the subject area of this paper. We do not address the problem of information extraction from natural language intelligence reports. [23] is a recent publication devoted to this problem.

2.2 On Fusion Concepts and Our Attempt for the Military Ambush Situation Assessment

Assessment means a given set of data for all objects (states) is correlated with a priori identified behavioural pattern for possible situations to describe the status of operations in the surveillance volume. Spatial and temporal characteristics serve to discriminate between patterns (e.g. suspicious activities). An automated data fusion method applied, would start computing degrees of fitness or associations between the set of pre-processed information from reports and a catalogue of available templates. The results of such a process gives the extend to which each template is consistent with and able to account for the received reports [30]. Exemplified, the degree of fit can be related to a degree of belief or a possibility that a certain template represents the situation. This could lead to the formulation of confidence factors as a weight assigned to particular data, the number of priority data occurrences, and so on. So far there is still no best solution formulated, but anyway, approaches aiming at fully automated problem solution diminish, whereas the communication (interaction) and interpretational skills of a human operator is accepted as necessary. Early advices to abandon any loading of elements in a template to individual situational conditions on an ad hoc base could only be checked out if, and this is our lucky position now, brute force computing can be done almost at no cost. Simulation-based analysis of this concept is ongoing.

The template for our ambush attack assessment is a summary of so called slots, specifying typical elements and characteristics of events, and typical and required relationships between assets and events. We will see later in this paper how we deal with the problem of unavailable but 'required' information. The situation assessment can be thought of as a means to estimate the enemy battle situation, what the enemy is doing (activities) and attempting to achieve (intent). We keep further in mind that the threat assessment task involves identifying the probable situation causing the observed data (information) and events. The inputs include event detections, state estimates and a set of hypotheses for evaluation. The outputs are, at least theoretically, conditional probabilities of the various hypotheses being considered in simulation [30, p. 276]. Diagnostic accuracy as well as timeliness are the dominant concerns in the assessment process.

2.3 On Modelling the Information

Military reports are usually based on HUMINT observations of the physical world. For almost every information a spatial and temporal reference (timestamp) can be obtained. This is a fundamental condition for fusion tasks like association, tracking or identification. The main entities of concern in a spatio-temporal application are the states of objects or features, their relation with space and time, and their interrelation in space and time. This leads accordingly to a representation on three axes.

- S - The spatial axis, representing the location of object states,
- T - A temporal axis for time, stamping object states and measuring of change between states.
- K - A knowledge axis, representing the classification process (and identification) of objects or features.

Any information I_i gives us a triple (S_i,T_i,K_i) defining the location S_i^k of an object O^k, giving it a timestamp T_i^k and increase the knowledge K_i^k of its state. Any shift on axis S is a change $\delta\ S_1^1$ for a given object O^1. The change in state $(S_0^1 + \delta\ S_1^1, T_0^1 + \delta\ T_1^1, K_0^1)$ for the object O^1 e.g. describes a movement of this object. Considering a proper implementation, the system will be able to answer the question if, regarding the basic knowledge about the type of object O^1, this is a valid solution within the model domain. In other words, can an object O^1 reach the location $S_2^1 = S_0^1 + \delta\ S_1^1$ within the available time $T_2^1 = T_0^1 + \delta\ T_1^1$. This is just an example for a regular query to the dataset. If we consider a change in state for an object O* along all three axes, we are forced to formulated queries in terms of higher abstraction [9].

The modelling of movement of the low level combat elements is a decisive process in every high resolution combat simulation system. Especially if the system is able to conduct automated route planning, the cost of movement and an estimation of the remaining distance from the regarded node to the target terrain has to be taken into account. Route planning should not solely be confined to time consumption along a linear distance to reach targets, but additionally to the three-dimensional path length including slopes, concealment and cover. This will substantially support the C^2-authority in developing suitable tactical behaviour. The geo-referenced processing of available information as a base for a complete and systematic Intelligence Preparation of the Battlefield (IPB) is self-evident [18], [27]. This includes the integration of the so called *Ground Truth* (realistic reproduction of scenario relevant aspects of the theatre of war), this type of situation context includes e.g. weapon engagement zones, supposed mine fields or impact studies of local weather conditions.

The already mentioned separation in static and dynamic information (Fig. 1.) is explained by the addressing of the processed information either to the set of base (fundamental) data in case of a 'static type' of information or alternatively in case of a 'dynamic' information as an element to the database of the perceived situation, the situation brief [17]. In this sense we explain an association of 'static' information, like strength, composition, logistics, technical characteristics of equipment, weapons and others to a capability oriented analysis. In opposition to that we treat information on movements and activities as preconditions for follow-up activities, and therefore we consider a different type of analysis, the ability analysis (Fig. 1.) as appropriate.

2.4 The Template Method

Templating is a logic-based pattern recognition technique used in data fusion applications since the 1970s [30]. The pattern matching concept has basically no limitations in complexity. This is valid for both, the observational data and the logical relationship used to define a pattern. It is a feasible way to combine algorithmic approaches, figure-of-merit approaches and knowledge-based heuristic methods. The setup of a template consists on necessary (mandatory) and sufficient conditions, with acceptance and rejections thresholds and the components that describe or make up the object.

Independent from the acceptance of the concept of knowledge-based information fusion by templates as a possible solution to the fusion problem, one might argue, that the existence of templates demands nothing else than formally correct information. In such a case, vague information or even randomly incorporated elements would contradict the application of templates. And to make things even worse, how to incorporate elements of surprise in an evaluation process for the fitness of an information regarding a specific template? If we would be able to treat elements of surprise as alternatives to more rational (doctrinal) behaviour, the loophole from this dilemma would simply be the procedural option generation and evaluation of alternative actions. This is one of the key aspects of our chosen attempt.

All elements or slots of the specific template for this example are given in detail by [17]. It was i.e. build on expertise given in the works of [8], [10], [12], and [29].

2.5 Factors of the Situation Context

Given any terrain setting of an observation area and receiving e.g. a report stating that four military trucks loaded with soldiers and obviously some boxed equipment left their home barracks, driving with (non-doctrinal) fast speed, could be alarming for a military observer. On the other hand without any supplementary context, despite the cars went on roads and their assumed driving direction, the task of assessment of a conflict or even threat situation cannot be carried out. A lot more of situation dependent background knowledge, the situation context, is necessary. But usually this knowledge will not be complete, will not be granular enough or just impossible to be fed into a computer database.

Situation context can partially be accessed via databases. GIS server e.g. provide terrain data (topography, hydrography, soils, vegetation, infrastructure, etc.). Climatical data can be digitally accessed like metereological or socio-political data. Though there still remains quite some situation related context, like for the ambush attack example the actual state of a conflict or relations of alliances, the interaction with the operator remains indispensable.

2.6 Databases Contents

The knowledge bases necessary for the report and information processing should contain knowledge on

- Entities, events, attributes and relationships (Ontologies)
- Spatial relationships descriptions (Pattern)

- Temporal behaviour descriptions (Scripts)
- Decision rules
- Tactics, doctrines
- Own-Forces status
- Vulnerability.

3.0 ON RULES, DOCTRINES, MILITARY DEFAULT BEHAVIOUR

Military actions are sequences of operations with strong dependencies. Operating sequences are interweaved by doctrines and rules. Adopting this fact, we can make the assumption that specific military operations could possibly be infered from antecedent behaviour or acts.

To depict the consequences of this standard behaviour, we give some examples for the principles which are contained in a movement order (which is incorporated in our example and e.g. [16], [24]). The order contains i.a. the column gap, time gap, road gap, march sequence, average speed, length of column, route order, march route and movement table (Tab. 1.). All these settings remain fixed for an untroubled march until the release point will be reached by the last unit of the column. A march column is under centralized command, is heading in one defined direction and units never cross each others course or overtake. A march column never splits. All these are examples for doctrines.

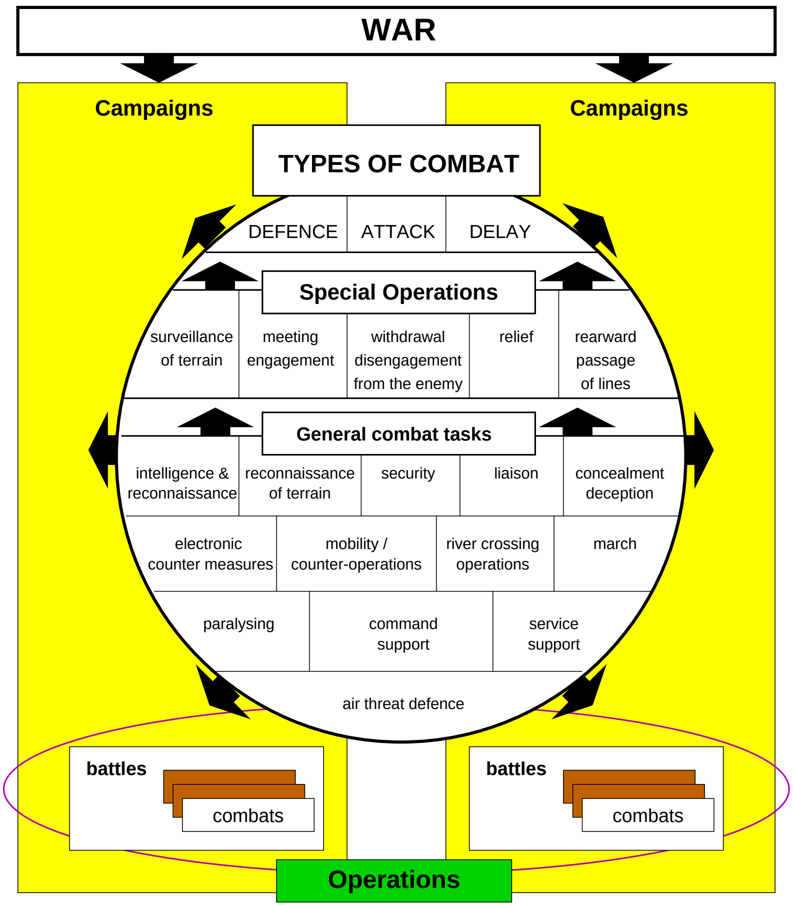

Figure 2: War as a structured system of separable interweaved operations, (from [20]).

Table 1: Extract from movement tables (from [20]).

Level	Motor Units	Distance [m]	Length of March Column [km]	Pass Time [min]			Remarks
				20 km/h	30 km/h	40 km/h	
Battery, Company	15	50	1	3-4	2-3	1-2	
		100	2	6-8	4-6	3-4	
Battalion	100	50	13	40-50	25-35	20-30	-5 March Units - Unit Distance 2-3 km
		100	20	60-80	40-60	30-40	
Brigade	900		120 (2x60)	3 hours	2 hours	1,5 hours	2 March Routes for 3 March Serials each

4.0 THE EXAMPLE

The developed concept for information fusion is basically independent from a specific military scenario. To illustrate it as model for further discussion we took the example of a military ambush attack on a deploying march column as a separable non-conventional military action from a comprehensive military scenario.

4.1 The Scenario

The political situation of the Republic of Bosnia and Hercegovina (BiH) (approx. 42° – 45° N, 16° – 19° E), as the scenario battlefield is shown in Fig. 3. This simulation scenario offers the possibility of describing tactical and operational intentions as concepts of operation on the level of individual missions of subordinate combat within a higher command level.

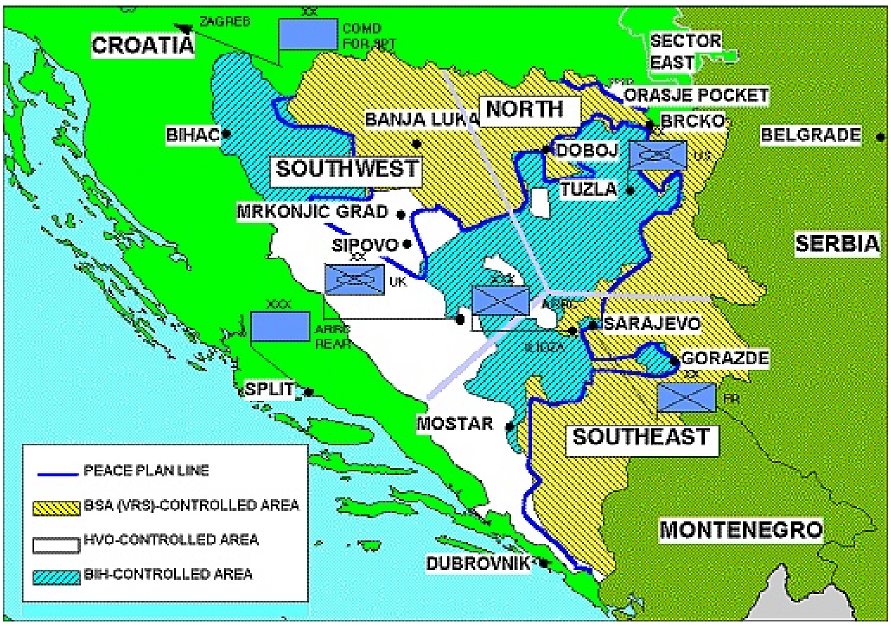

Figure 3: The Republic of Bosnia and Hercegovina (BiH) as theatre for this simulation example.

The two entities are the Federation of Bosnia-Hercegovina (the Moslem-Croat alliance), and the Serb Republic of Bosnia-Hercegovina (Republika Srpska). Since the declaration of independence of Slowenia and Croatia (6/25/1991) the complexity and diversity of conflicts within the region of former Yugoslavia is hardly to understand. This is still valid for the evaluation of possible future operational aims of war parties. Irrational and emotional based actions of military and political leaders contradict western logic. Animosity e.g. can solely be driven by emotions of revenge or regionally focused struggle for power. This can be explained by the geographical conditioned sectionalism, the unrelated peoples and religions, and the forced heteronomy.

4.2 Experimental Details

The Dayton Peace Accord (11/22-25/1995) not only defined the new frontiers, but also fixed the amount and allocation of remaining weapons and military personal of the former war factions within this territory. Therefore a global a priori overview can be accessed. The initial dislocation of all engaged forces can be seen as given information, due to the regulations fixed. The rival armies are separated by a demilitarised zone of about four kilometres width (Peace Plan or Inter-Entity Boundary Line (IEBL), Fig. 3.).

4.3 Report Situation

The message acquisition situation can be considered as adequate for the problem, due to a large amount of international groups and their observers, e.g. the International Police Task Force (IPTF), the United Nations High Commission on Refugees (UNHCR) or the United Nations Mine Action Centre (UNMAC). Fig. 4. shows some statistical information about the report collection of phase I of the scenario. The upper chart shows the absolute number of reports relative to the delay of the information. We see, e.g. 26 instantaneous information, respectively about 20 % of the information with individual timestamp, which are without any time delay between observation and report. The lower chart shows the report delay for each individual message. Several colours per bar indicate the report of more than one information with individual timestamp (up to four, message no. 63). Important for the testing of the concept is, that for the whole military report stream in our scenario the average information ‘age’ is marginally less than 15 Min. This should be kept in mind for the analysis tasks and possible expectations on the efficiency of a support concept exclusively dependent on HUMINT reports. The reports used for our example are a subset of this Phase I.

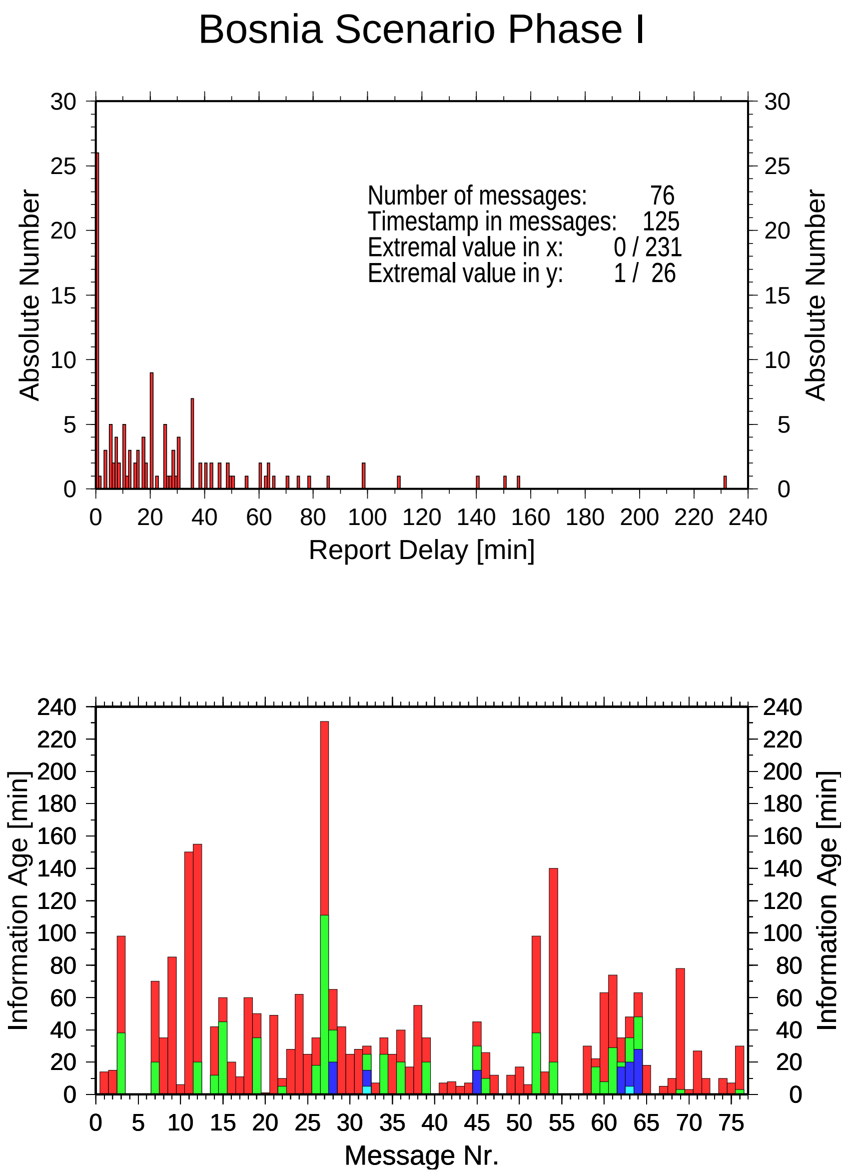

Figure 4: Charts displaying time delays between observations and reports.

4.4 Database Examples

The ambush attack scenario under examination can be described as follows: A place with high priority for its strategic importance is the city of Doboj in the central North of the country (Fig. 6.). The cities control is the guarantee for the access to the so called Oszren pocket, a hilly area south of the Spreča river still belonging to the Republika Srpska (RS). The Serb Republic Army (VRS) has some major installations in the city of Banja Luka about 70 km from the IEBL close to Doboj. A major road leads via Teslič, about 10 km west from the IEBL to the centre of actions Doboj, heading there from south-western direction. Therefore it is an important task for the Bosniak Army (ABiH) to get this road under safety catch as soon as possible. A ABiH brigade being based about 90 km south at Zenica is going to overtake this mission. This is done under the traditional policy of centralized command and control, which implies, that in case of an alarm or mobilization, the first command is already given a priori. This is military default behaviour, and therefore gives a chance to be calculable.

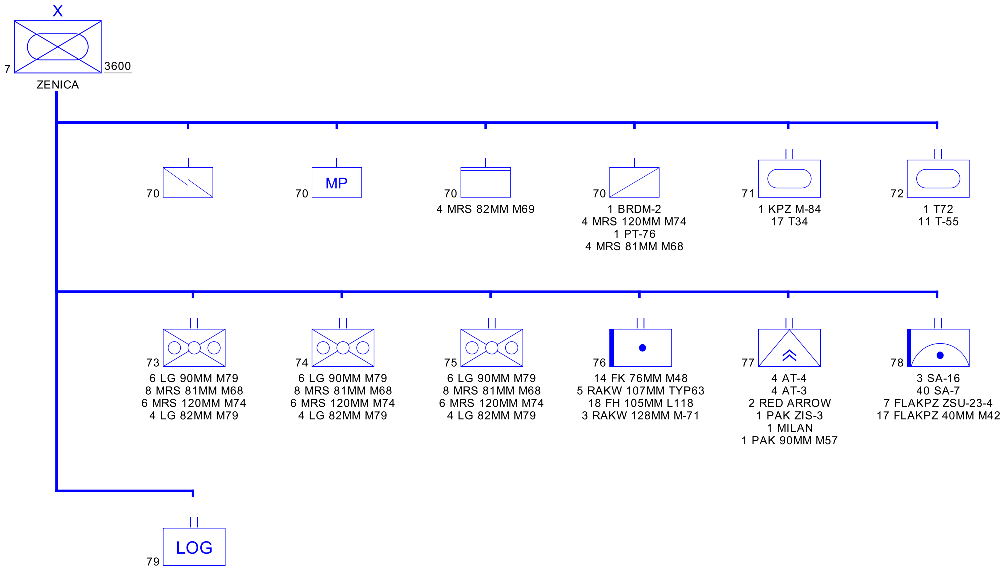

Figure 5: Organizational chart of the mechanized infantry brigade sending out the march column.

One problem for the brigade commander is, that despite the major road along the Spreča valley, which is unfortunately already under artillery fire by the VRS, only one secondary road exists leading directly (and fast) to the ordered area of operation. This road cuts the mountainous area close and along to the IEBL. There is no accessible road crossing this borderline along a distance of about 15 km for this region. The zone of the closest distance between two roads, one on the side of the RS and the other on ABiH territory, lies about six kilometre south of Teslič. The distance is less than five kilometre. After mobilization, the march column needs about four hours to get on the march route. To reach the mentioned zone of maximum convergence of the two roads, another three and a half hours are necessary (Fig. 6.).

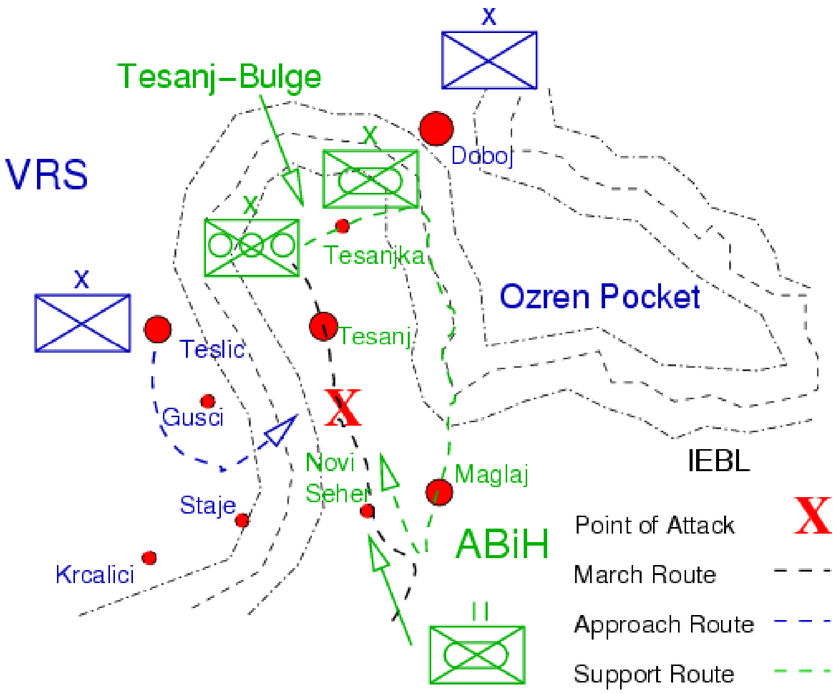

Figure 6: The situation of the military ambush attack.

Figure 6. shows the situation along the approximately last 25 km for the march column. The factions of the Army of the Serb Republic (VRS – blue colour) and the Bosniak Army (ABiH – green colour) aim at the defence (VRS), respectively attack (ABiH) of the city of Doboj (Fig. 2.). The relocation movements by the ABiH to the northern part of the Tesanj-Bulge can only be deferred by the weaker VRS. The latter was surprise attacked by the ABiH and needs time for preparing its over all defence.

5.0 SIMULATION AND FIRST RESULTS

Our testing of the concept starts with the following conditions. The commander of the brigade has to order his two tank battalion (71 and 72, Fig. 5.) to a release point at Tesanjka (Fig. 6.). The tanks are crucial equipment for the operational tasks of the Bosniak Army in the follow-up conflict. By setting up the movement table for the march, he is keeping in mind that the march units of these two tank battalions will be the most vulnerable elements within the column, in case the adversary succeeds to clear up the Bosniak intentions. About this time the Bosnian Army receives a report stating that four VRS military trucks loaded with an unknown number of soldiers and obviously some boxed equipment left their home barracks in Teslič, driving with (non-doctrinal) fast speed southwards. The same trucks return empty about three quarters of an hour later.

In the absence of any further situation context , the analysis of this information will end up pretty fast and the outcome will be pretty poor. The support tool may add four trucks to the knowledge base and an uncertain number of soldiers driving around to the situation brief database. But even with the sparse information from section 4, any brigade commander responsible for giving the order to a march column in that direction may be aware at least of the information of relocation movements in conspicuous fast speed. Analysing the situation, we face, that all information on dislocation of forces and equipment used in this ambush attack situation are common knowledge for both sides. In addition the geographical setting is well known to the factions. Even uncovering the most probable first action mission of the tank battalion is no difficult task, all the rest are simple algorithms, like standard Travelling-Salesman solver utilizing the facts from section 3. Just considering so far only the capabilities of the potentially war factions [21]. Nevertheless we assumed quite some context information in addition, which in fact cannot be neglected in carrying out real simulations of this kind. Some examples are i.e. the peace plan line or information on ethnic separation. Tests with a so far implemented support tool give a result of a necessary time consumption of 1.5 hours for the advance of a platoon between the two roads, equipped with light mortars, anti tank weapons, grenades and mines. Not taking into account a possible support of this operation by irregular local forces, even the regular tactical reserve troops might be able to carry out a surprise attack against the Bosniak tank battalion in time. The remaining time of almost one hour will be sufficient to set an ambush trap targeting the ABiH tank battalion. This is exactly what happens in the scenario. Variations in parameter settings and incorporation of randomly generated 'report' information allow the designing of a marching order with the same tool, which avoids to set any unit under added risk.

We can sum this up with the conclusion that the knowledge-based fusion of messages is an important task for the Intelligence Preparation of the Battlefield (IPB). The introduced method is capable for dealing with queries like, is the location S* at the time $T^* + \delta T^*$ still save as a marching route. Or, is it possible for the enemy to reach a specific place with any special equipment in a given amount of time, just having a course idea on starting and release point.

6.0 CONCLUSION

The impulse for this work were questions like, can a template based information fusion support be given for highly complex non-conventional military operations which suffer by a couple of limitations in a priori setup and restrictions to the useful information available, which came up following the work in [16]. The answer to this topic is not only positive, far more it seems, that the template based problem solving strategy may be the only one dealing with this class of 'ill-posed' problems. The major constraint is to rely on the man-in-the-loop. Without dialogue and interaction no machine support seems to be feasible. We see in our of course still rudimentary conception especially benefits for operations in Low Intensity Conflicts (LIC [5], [22]). They are characterised by manageable dimensions in space and time. The creation and setup of templates for other examples of (non-conventional) military operations will be an important step for further succession.

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Paper No.9 **NATO RTO – IST-040/RSY-012** 2003, 20-22th October, Prague, CZ

A Man-in-the-Loop Support Concept for Military Ambush Threat Assessment Based on Reconnaissance Reports

Frank P. Lorenz and Joachim Biermann

Content

- On Report Processing
- A Processing Concept
- Databases & Situation Context
- The Template Idea
- Scenario Study & Demonstration
- Summary & Outlook

Stages of Report Processing

Deduction of Enemies Strength and Intention

↑

Matching With Background and Current Information

↑

Observation of (Single) Objects and Activities

Some Aspects of Information Fusion

- Situation Assessment From Military Reports
- Information Analysis, Inference and Deduction Process
- The JDL Model Provides a Common Reference for Addressing Information Fusion Issues
- Support by Automated Processing Tools
- Imperfect Information vs. Suitable (Perfect) Model?

The Processing Concept - A Case Study

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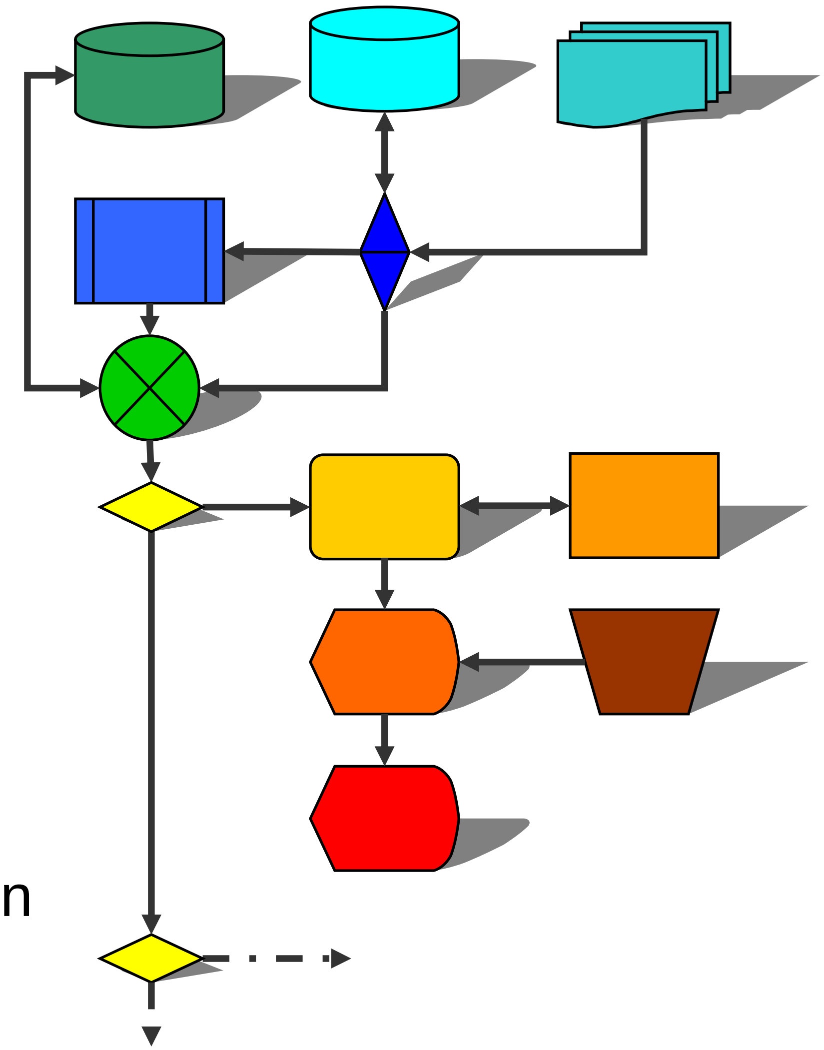
- Capability Oriented Analysis
  Information Processing on Data
- Ability Oriented Analysis
  Information Fusion on the Perceived Situation
- Template Matching
- Missing Data Analysis
- Situation Context Interaction
- Assessment of the Threat Situation



Databases (Examples)

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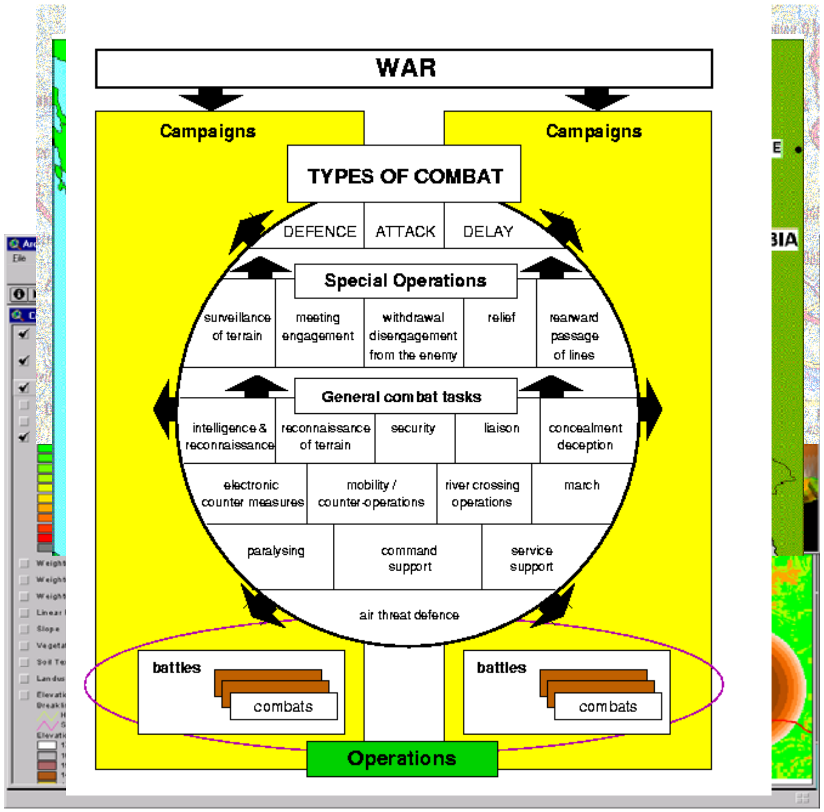
- Entities, Events, Attributes and Relationships
- Spatial Relationships (Pattern)
- Temporal Behaviour (Scripts)
- Rules, Doctrines
- Own Forces Status (Vulnerability)
- Terrain Analysis



Situation Context Data Example - Terrain

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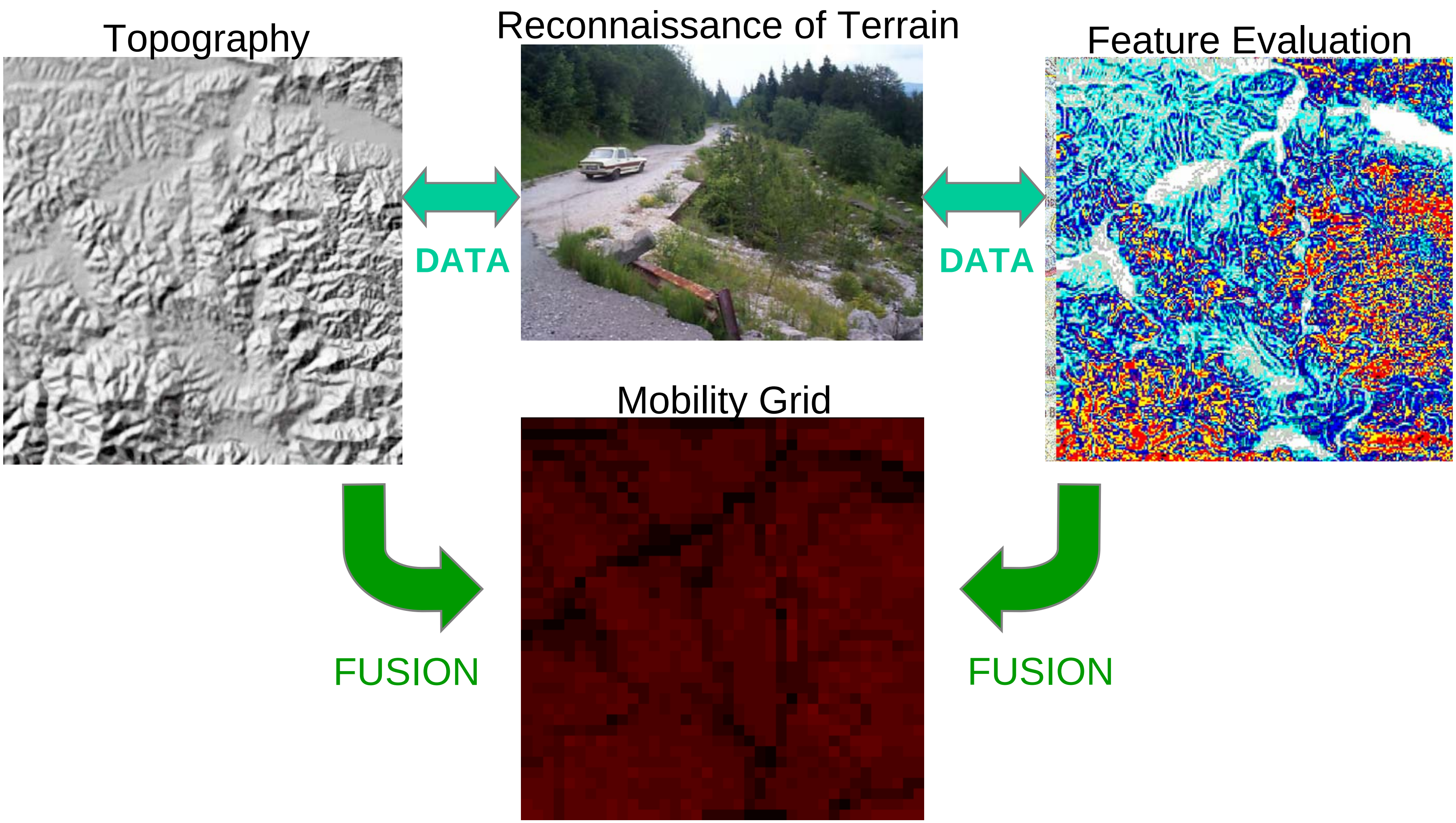

The Template Idea – A Case Study

- Spatial and Temporal Characteristics
- Priority Data
- Relationships Between Assets and Events
- With Respect to Underlying Rules, Doctrines or Known Military Default Behaviour

- Logic-Based Pattern Recognition Technique
- Basically no Limitations in Complexity
- Acceptance and Rejection Thresholds
- Consists on Necessary and Sufficient Conditions

The Template Idea – Military Ambush Threat

	Static Information	Dynamic Information
Basic Elements	Armament Logistics Personnel …	Equipment Logistics Usage Value …
Spatial Facets	Avenue Climate Cover Distance Geogr. Position Infrastructure …	Approach Concealment Infrastructure Weather …
Temporal Facets	Accessibility Displacement …	Effort Reachability …

Situation Context
Aggressor's Situation Knowledge Combatant Asymmetry Local Support Modus Operandi Knowledge State of Conflict …

The Processing Concept - A Case Study

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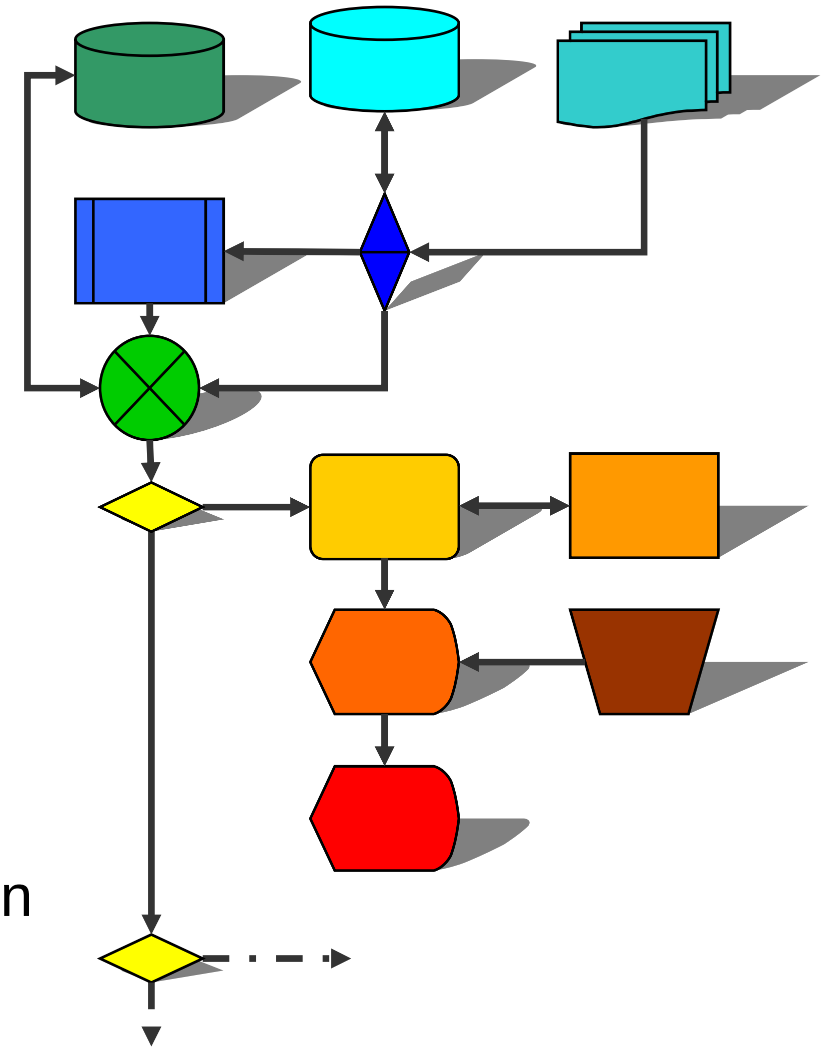

Some Experimental Details of the Scenario

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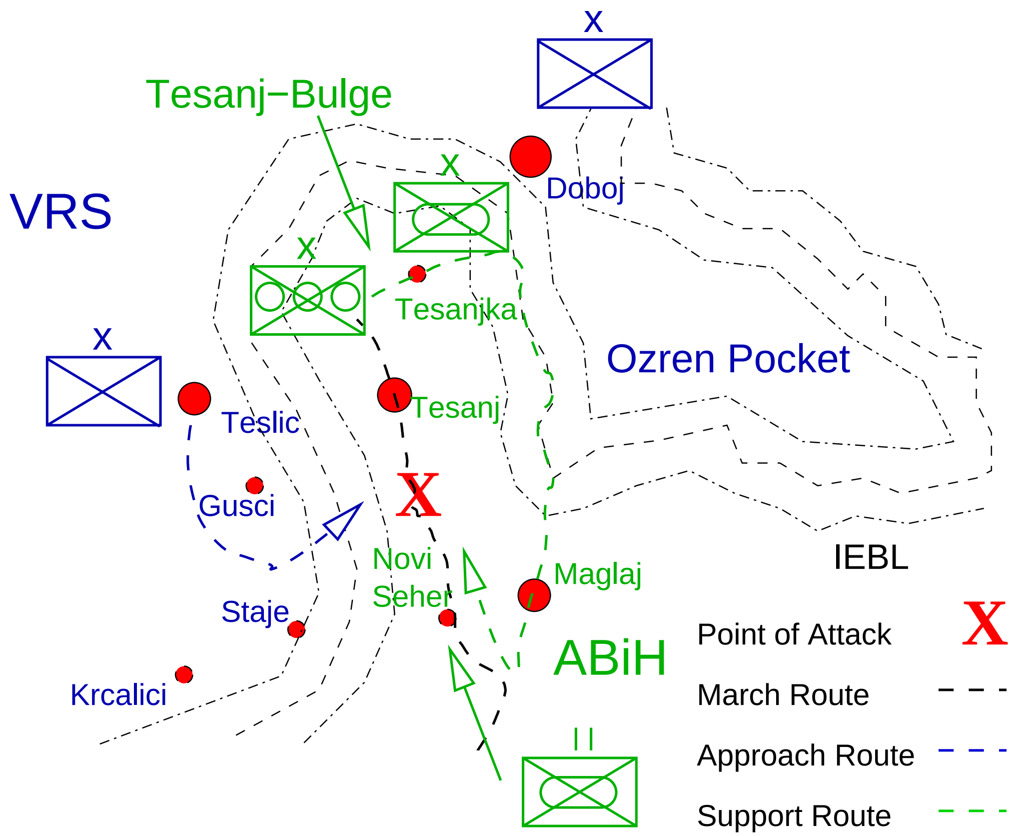
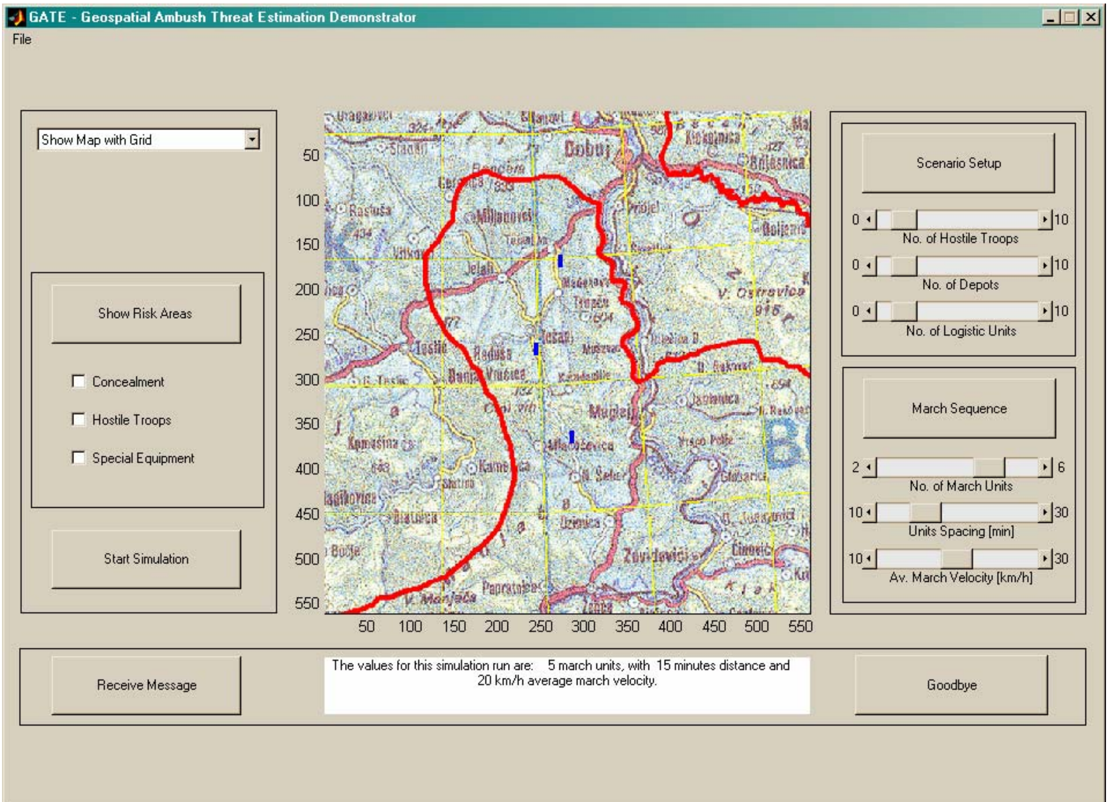


Interactive Geospatial Data Analysis



Analysis Tool for Military Ambush Threat Assessment

- Situation Representation
- Simulation of March Schedule
- Ambush Attack Site Analysis
- Adversary Approach Analysis

Demonstration

Summary & Outlook

- Military Operations are Deliberately and Purposely
- For This Reason Their Features are Regularities
- Keep the Intelligence With the Experts
- Develop Tools for Permanent Systematic Analysis
- Templates set up an Ontology for the Fusion Task
- More Situation Independent Recurring Pattern of Military Behaviour Must be Analysed
- Simulations are Necessary to Gain Further Methodological Knowledge About the Information Fusion Process
- Proof for Adaptability and Interoperability