

C-STCA

COMSOFT SHORT TERM CONFLICT ALERT

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PRODUCT INFORMATION

C-STCA offers a new perspective on short term conflict alert by featuring a stochastic approach for conflict prediction, which optimises the trade-off between in-time prediction and nuisance alert rate.

Short term trajectory prediction based on surveillance data is a fundamental issue underlying safety nets. C-STCA addresses this problem by introducing a novel stochastic approach which models the uncertainty of trajectory and conflict prediction. This stochastic approach enables an optimal trade-off between in-time conflict prediction and nuisance alert rate.

In order to allow optimal tuning in heterogeneous and complex operation environments, the system

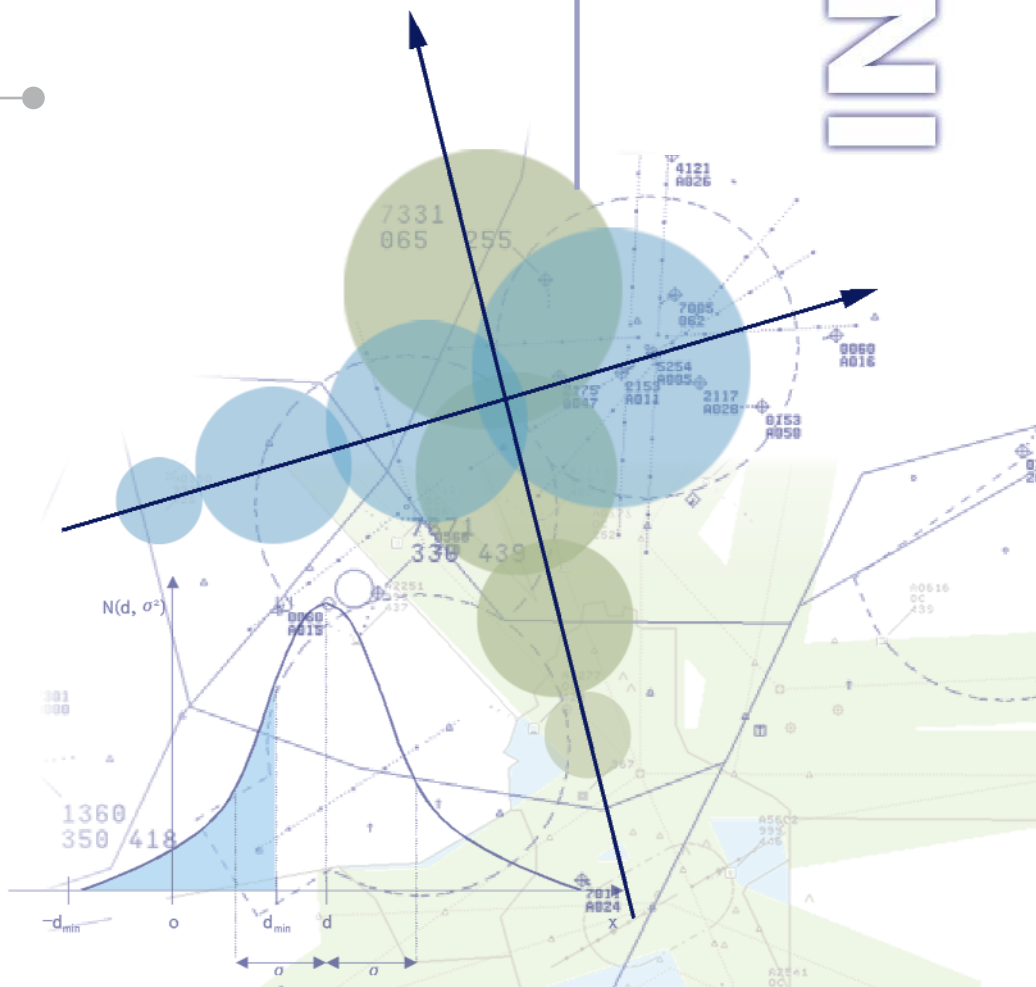
provides a deep insight into the nature, severity and uncertainty of conflicts.

C-STCA supports the flexible definition of different region types describing specific airspace profiles. It is highly configurable and can be optimised for use in many different ATC environments.

The system can operate with any SDP and display system, in particular with those supporting the ASTERIX standards.

HIGHLIGHTS

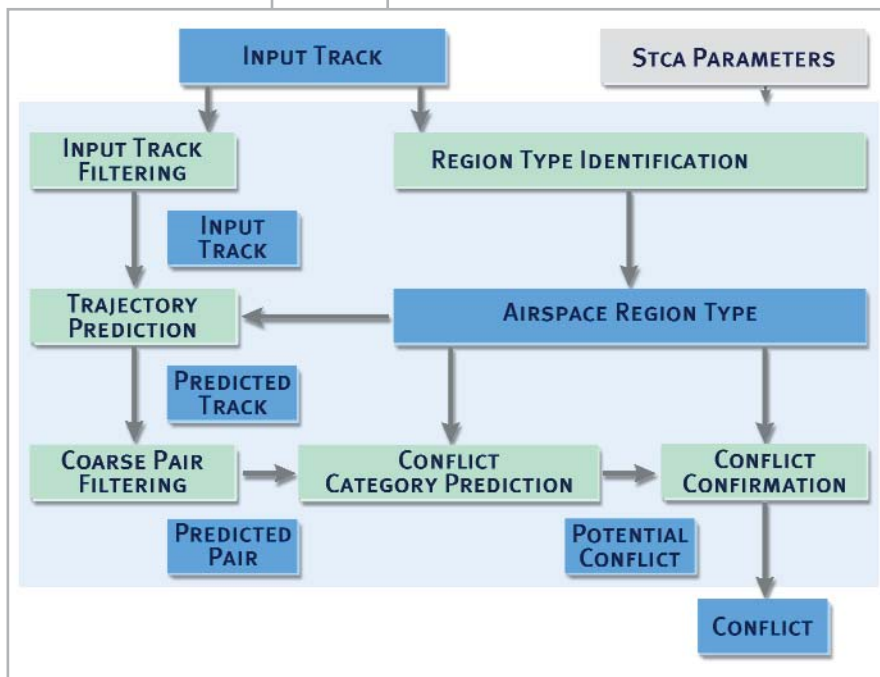
- Innovative stochastic approach for conflict prediction
- Optimal trade-off between in-time conflict prediction and nuisance alert rate
- Extensively site-configurable, supporting all operational environments
- Support for different region types with own airspace profile
- Input and output supporting the ASTERIX standards
- Extensive information about nature, severity and uncertainty of conflicts



TECHNICAL DATA

Algorithm	<ul style="list-style-type: none"> - Stochastic model for trajectory and conflict prediction - Coarse filter for quick pair elimination
Configuration	<ul style="list-style-type: none"> - Definition of different airspace region types with own system configuration (TMA, CTR, En-Route, Approach, Departure, etc.)
Input	<ul style="list-style-type: none"> - Tracks - ASTERIX supported (categories 3, 30 and 62), further formats upon request
Output	<ul style="list-style-type: none"> - Conflicts - ASTERIX supported (category 4), further formats upon request
Platform	<ul style="list-style-type: none"> - Intel- and UNIX-based server platforms

TECHNOLOGY



System Architecture

The basic idea of C-STCA is the definition of a stochastic model for trajectory prediction, in which the uncertainty of the prediction is represented as a function of the prediction time.

The stochastic models of the trajectories predicted for two aircraft are combined to construct a stochastic model for minimum separation infringement. In the latter model, probabilities of defined separation infringements are compared to given thresholds. Additional conflict criteria, such as crossing and divergence tests, allow C-STCA to predict the severity of a conflict, expressed by its category.

A coarse filter is applied to quickly eliminate all pairs of aircraft that cannot possibly be in conflict within the prediction time frame.

Finally, a conflict confirmation mechanism is introduced in order to take into account erroneous track data or transient track values.

FEATURES

- Adjustable confidence and confirmation level for conflict declaration, depending on conflict urgency and airspace region type
- Probabilities of major/minor separation infringements
- Crossing and divergence identification
- Conflict categories expressing the severity of conflicts
- Possibility to use aircraft intention information, e.g. cleared flight levels, from flight plan or controller input
- Split tracks detection
- Mode 3/A code selection to restrict the set of aircraft that need to be protected by the STCA function
- Special type of airspace regions, called manoeuvre regions, aimed at predicting aircraft manoeuvres
- Capability to define and activate/de-activate regions on-line
- Capability to inhibit conflict prediction for specified regions or aircraft on-line

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