

THE NX-LOG PROJECT

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OBJECTIVE

The objective of the project NX-LOG is to construct a new decision support system for local avalanche assessment.

This system should give for every day and real time, an accurate localisation of avalanche risks for a given area. Therefore, it will have to provide a stability diagnosis for each slope of this area. This project is answering an urging need of various responsables for avalanche safety: they regularly have to take irreversible and far reaching decisions that are often extremely delicate (warning, evacuation, preventing bombing, etc.)

REALISATION

So far two methods are in use trying to solve the problem of assessment of local avalanche risks:

-analogous reasoning.

It is based on the assumption "like causes produce like effects" and follows the sequence:

- 1.Description of the actual nivo-meteorological situation (Input).
- 2.Search for similar situations in the past.
- 3.Check the risk for these situations according to the corresponding records.
- 4.Assess the present risks (Output).

The existing systems go through step 1,2,3. Step 4 is left to the human operator.

The first of these systems, and probably with the best performance, is the system NXD (Buser, 1983,89), (Buser, Bütler, Good, 1986), (Buser, Good, 1984).

-deductive reasoning.

It is based on combining logical deductions:

- 1.Description of the actual nivo-meteorological situation (Input).
- 2.Deduction of the actual risks (Output).

The only system up to day based on this technique, known as artificial intelligence method, is the system AVALOG (Bolognesi, 1991).

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The aim of the project is to merge these two complementary methods into one single model.

Actually, three researchers participate in this project which is limited to three years. This group cooperates with local patrolmen and avalanche forecasters; several european ski resorts have decided to collaborate, especially to devise the "duty book", and to make the tests for checking the validity of the system.

Over all more than 15 people (theoreticians and practitioners) are involved in the project NX-LOG.

PERSPECTIVES

The merging of analogous- and deductive reasoning lets expect very interesting developments: it seems possible to give a capability to the system to improve its knowledge by itself; NX-LOG, exploiting analogies to build diagnosis, would become more and more reliable as long as its database expands. So, it would be able to acquire its own (unlimited !) experience: a first level of learning...

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