



# Séminaire du CIRRELT

## Pr. Mikael Rönnqvist

Chaire de recherche du Canada  
sur la recherche opérationnelle en ressources naturelles  
Département de génie mécanique, Université Laval



### WHICH IS THE BEST ROUTE AND WHY

**Abstract:** Calibrated Route Finder is a system that establishes the most efficient route for logging trucks to be used for invoicing of the transportation work in Sweden. The route selection depends on many road features, such as length, road class, curvature, hilliness, speed limit, road width and many more special considerations. It is very difficult to manually find a suitable weighting of the road features. Our approach is to use an inverse optimization formulation with a large number of agreed and measured so-called key routes that form a set of optimal solutions of a minimum cost routing problem. The system has gradually been developed based on reporting and requests from the users. Recent implemented development is to include curvature and hilliness, and detailed crossing behaviour with stops, acceleration and breaking as road features. These features are developed using highly detailed spatial data from a national road database together with detailed road measures from special trucks. Particular care needs to be taken to errors and missing data in the large road database. The system is gradually introduced amongst all forest companies in Sweden, and is currently used to invoice about 50% of all 2 million forest transports done annually. This corresponds to 80 million tonnes with a transportation cost of 700 million Euro. There are large savings both in quantitative and qualitative terms. For the latter the system contributes to standardization, fairness and simplicity and for the former reduced administration, costs and greenhouse emissions.

**Note:** Mikael Rönnqvist is a professor in industrial engineering at Département de génie mécanique (Université Laval). He currently holds a Canada Research Chair (tier 1) in Operations Research in Natural Resources. He is a member of the research organisations/networks FORAC, VCO and CIRRELT. His research interests are in the areas of industrial and practical use of Operations Research, in particular in the forest industry. He has been involved in the development of many industrial decision support systems based on optimization. Professor Rönnqvist completed his Ph.D. in optimization at Linköping University in 1993. He has held academic positions in Sweden, New Zealand, Norway and Canada.

MARDI

24 mai 2016  
10 h 30

Local 1317  
Pavillon Palasis-Prince  
Université Laval

Ouvert à tous

**Organisateur:**  
*Leandro Coelho*



POLYTECHNIQUE  
MONTREAL

