

# Decision Support for Route Planning to Reduce Heat Stress Considering the Time of the Day

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Heat stress is a serious risk, in particular for certain groups like elderly or patients with multiple sclerosis or heart disease. Developments like the ageing of society, the increasing urbanisation (urban heat island effect) and the climate change are increasing the risk that people are affected by heat stress. One way to reduce those risks is to adapt the everyday behaviour, e.g. by performing purchases in the supermarket or pharmacy in the morning or evening when temperatures are lower.

Therefore we are presenting two different approaches for decision support tools that can help people to adapt their everyday behaviour. At first we're presenting a route planner for pedestrians that can find a route with minimal heat exposure. The second approach we're proposing is a tool that supports the user to select the point in time with a minimal risk of heat stress, considering e.g. the opening hours of a shop. In both cases we are utilizing, among other, remote sensing data of a thermal flight scanner.

Our results are showing that both approaches are able to reduce the heat exposure and therefore can help people to decrease the risk of heat stress in their everyday life.

## 1 Story

- Motivation
  - heat is critical for humans
  - particular problems for risk groups (illness, old, etc)
  - walking to areas often done action in particular to typical locations (shopping, health care, etc)
  - those actions have to be done

- Problem definition
  - how to minimize the impact of heat stress on walking paths?
  - subdivided into:
    - \* for a given route?
    - \* When and how to walk typical routes, e.g. pharmacy, doctor
- method:
  - Goal of this paper: We want to provide a routing method to minimize the heat stress of typical walking actions
  - We do so by providing a value function for heat stress which can be used in route planning
- Evaluation:
  - Our data set
  - Evaluation 1 on routes given date in time. (pure routing approach) and its metrics
  - Evaluation 2: producing queries for typical walking tasks (our selection) and their evaluation
  - implementation as a demonstrator is produced and available at *homepage*
- Conclusion and contribution

## 2 Introduction

(Dijkstra 1959)

## References

Dijkstra, E. W. (1959). “A note on two problems in connexion with graphs”. In: *Numerische Mathematik* 1.1, pp. 269–271. ISSN: 0029-599X, 0945-3245. DOI: 10.1007/BF01386390. URL: <http://link.springer.com/article/10.1007/BF01386390> (visited on 04/07/2016).