Naviki
A Process to fuse Bicycle Tracks automatically

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Outline

► Comparison of navigation systems for cyclists
► Provision of tracks
► Automatic integration
► Quality control
Research and Development Project
Research and Development Project

► Project duration till September 2010

► Team of the Software Engineering Laboratory at the University of Applied Sciences Münster
  • Project leader: Prof. Dr. Gernot Bauer
  • Public relations: Achim Hennecke
  • Research and Development: Sven Luzar
  • Five additional team members
Public authority routing portals

Routing portals of public authorities
- Routing between each source and destination in a restricted area
- Reviewed, high-quality routes
- Insufficient mesh density
- Bounded regions

Track sharing networks
- Provision of single tracks (no routing)
- Doubtful quality and often semiprofessional
- High bike specific data volume
- Community and individual documentation
OpenStreetMap

- High data volume
- Community and individual documentation
- Technical usage
- Users must draw the map by hand
Steps to apply the Naviki system

1. Recording GPS Tracks
2. Webserver
3. Integration
4. Webserver
5. Navigate with GPS Tracks

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New mobiles are able to record tracks. Naviki offers free software for recording.

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Upload at Naviki

Simple transmission from a GPS–Device to the Naviki Internet portal.

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Provision of tracks

Base: Map or aerial photograph

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Integation of tracks by uploading the tracks to the Naviki internet portal.

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Provision of tracks

Users successively add ways.

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Automatic integration

Automatic adjustment between nearly equal track sections.

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Naviki identifies routing nodes and integrates different paths into a mesh.
Naviki assembles nearly equal track sections into one single segment.
A huge integrated mesh emerges.

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The integrated mesh increases through user generated content.
Increasing mesh

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Quality control

- Automatic quality improvement through integration
Improvement in quality

On routing requests Naviki prefers frequently uploaded track segments.
Quality control

- Automatic quality improvement through integration

- Social control mechanisms
  - Valuation method for users and tracks
  - Comments
  - Alerts and disqualification for unsuitable track sections

- Additionally: Classification through public authorities
  - Assignment of attributes
Naviki mapbase

- Mapbase: currently Google Maps and OSM
  - Wide distribution
  - No regional boundaries
  - Familiar usage
  - Fast
  - Adapted for the specific requirements of Naviki

- Mapbase is exchangeable
  - Maps from public authorities
Benefits for users

► Attractive, simple and fast usage
► Free decision whether to use the public mesh only or also the user generated network
► Individual preferences during search requests (Attributes for the segments and environments)
► Additional individual statistics
► Networking between users
► Supraregional uniform information desk
► Free of charge
User motivation

- Disposition to articulate oneself on the Internet
  Example: Success story of Wikipedia since 2003
  - Volume
  - Actuality
  - Reliability

- Worthwhile engagement for bicycle traffic

- Pleasure

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Roadmap

► Today (September/October 2008)
  • Some functions visible
  • No public access

► Spring 2009
  • Expanded scope of operations
  • Public start up
  • Growing data volume

► Till summer 2010
  • Complete scope of operations
  • Widespread and accepted by users