

# Location-based Recommendation Using Citizen science and VGI data sources

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## Outline

- An introduction of
  - Recommender Systems
  - VGI & Citizen science
- Problems & Motivations to use VGI & LBSN for Location based recommendation
- Summary & Research directions

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## Introduction

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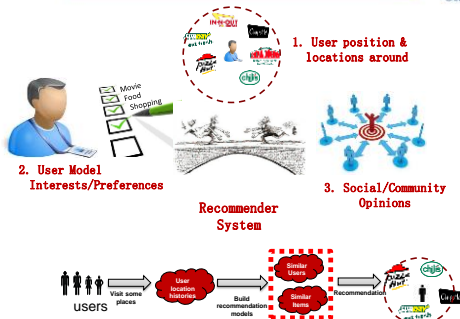
## Recommendation Systems

- To answer some questions such as:
  - *I want to find nice food, where should I go?*
  - *I will visit the downtown of Tehran, what can I do there?*

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## Key Components in Location Recommendation



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## User Profile

- simple ↑
- demographical info
    - Age, gender, location, ...
  - Interests, preferences, ...
  - Observed behavior
  - Ratings
  - ...
- ↓ complex
- complete "lifelog"

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## Source of User Profile

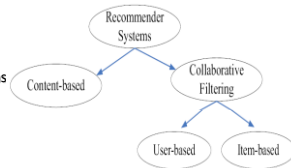


- Explicit: entered by user (questionnaire)
- Implicit: gathered by system
  - Recording person's behavior
  - Learning interests/preferences/...

## An Overview of recommendation Techniques



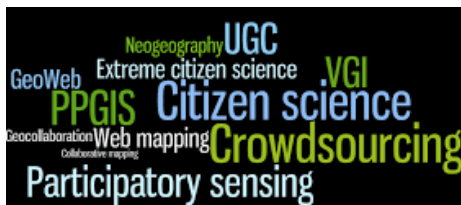
- Content-based Filtering  
Look at all items a user likes, Then recommend more items that fit same pattern
- Collaborative Filtering  
Recommend items based on item similarities or based on user similarities



## Volunteered Geographic Information and Citizen Science



- A network of citizen volunteers to provide GI



## Problems & Motivations



## Problem with traditional data Sources of User/Item model



- Recommendation based on data from small part of community (one person as recommender)
- User experience/knowledge changes and a need to update user profile on different timescale
- A need for exploratory recommendation (recommend items outside user's interest space - "serendipity")
- ...

**Motivation:** Improve location-based services by integrating new data sources (VGI & LBSN) into the location based recommender systems

## VGI & Location based Social Networks (LBSN)



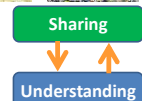
### ➤ Sharing Location-embedded information

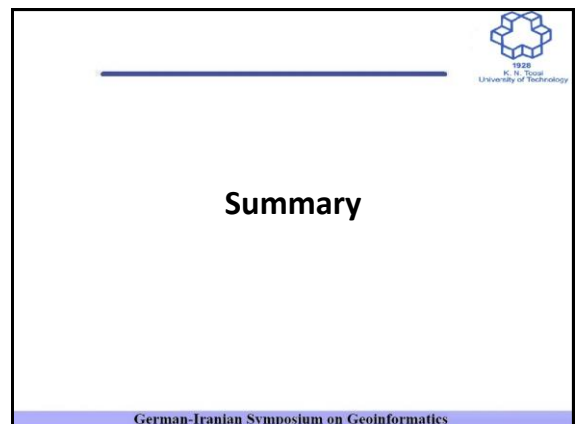
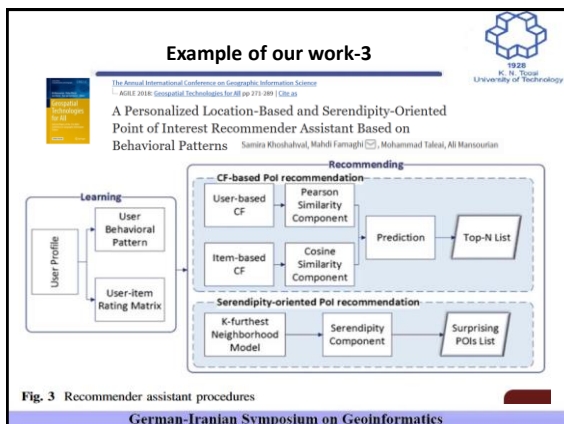
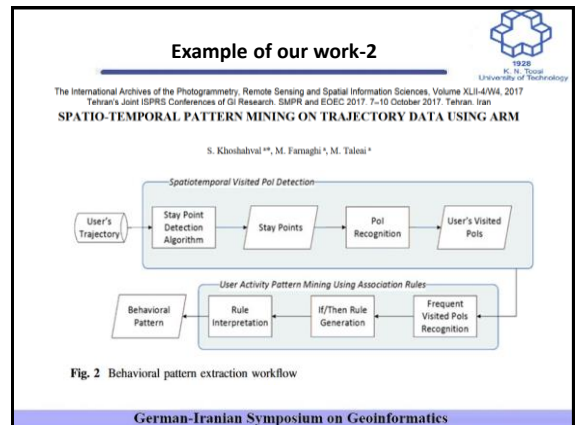
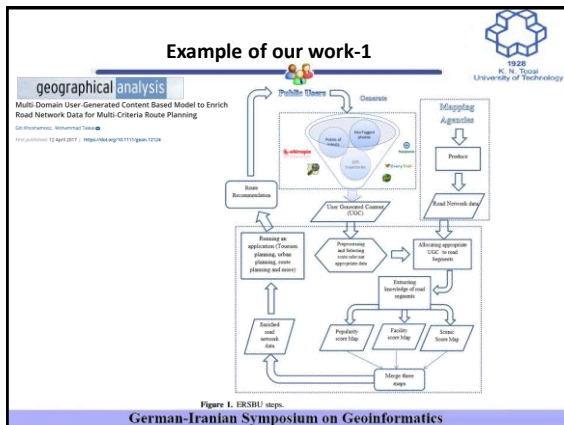
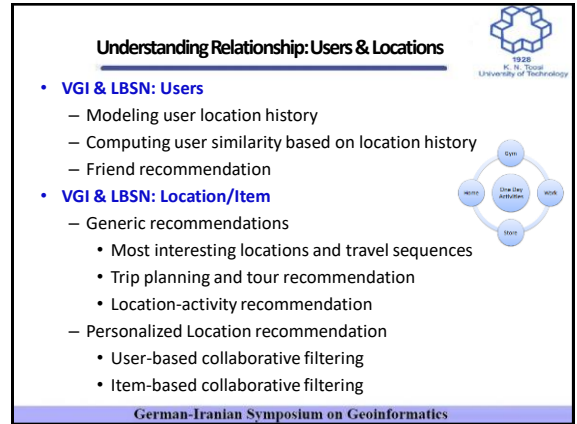
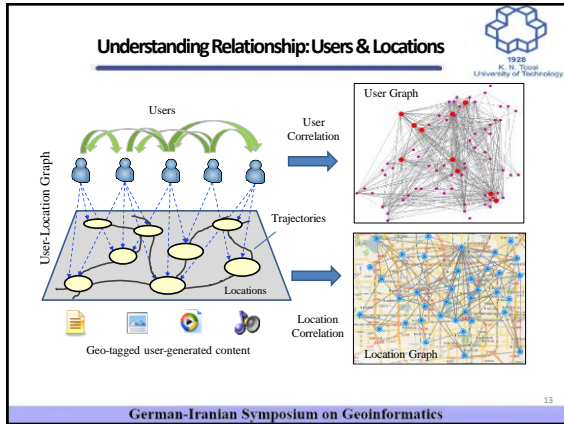
- Geo-tagged user-generated media
- Point of Interest
- Trajectory



### ➤ Understanding

- Location history of a user at a given timestamp
- User interests/preferences/ behavior/activities
- Location property
- interdependency (derived from shared data/locations )
  - User-user (two user share similar location histories)
  - Location-location
  - User-location





## Summary



- Recommender systems has grown as an area of both research and practice
- VGI & LBSN provides useful data to complete user's profile (lifelog)
- VGI & LBSN provides useful data to Identify and categorize new Items/Locations/Users
- VGI & citizen science enabled new directions for recommendation:
  - To understand the correlation between users and locations
  - To form multiple users' location histories
  - To provide social and temporal data
  - . . . .

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## Questions and Comments



THANK YOU

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