Utility-Aware Social Event-Participant Planning

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Introduction

• Event-Based Social Networks (EBSNs)
  • Online platforms that facilitate offline event organization and participation, e.g. Meetup and Plancast

• Motivation
  • Arrange proper social events to interested users
  • Existing works: either assume user attends one event or ignore location information
    • Spatio-temporal conflicts & travel expenses

The USEP Problem

• Given
  • A set of events \( V \)
    • Each \( v \in V \): capacity \( c_v \), location \( l_v \), time interval \([t^v_1, t^v_2] \)
  • A set of users \( U \)
    • Each \( u \in U \): location \( l_u \), travel budget \( b_u \)
  • Travel cost \( \{\text{cost}(u, v)\} \)
  • Utility value \( \mu(u, v) \)
  • Find a planning of schedules \( A = \cup_u \{S_u\} \)
    • Maximizes \( \Omega(A) = \sum_u \sum_{t \in T^u} \mu(v, t) \)
    • Capacities of events are not exceeded
    • No schedule has time conflicts
    • \( \mu(v, u) > 0, \forall v \in S_u, \forall u \)
    • Travel budgets of users are not exceeded

The USEP problem is NP-hard

<table>
<thead>
<tr>
<th>( u )</th>
<th>( v )</th>
<th>Cost</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>( u_1 )</td>
<td>( v_1 )</td>
<td>0.2</td>
<td>0.6</td>
</tr>
<tr>
<td>( u_2 )</td>
<td>( v_2 )</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>( u_3 )</td>
<td>( v_3 )</td>
<td>0.4</td>
<td>0.7</td>
</tr>
</tbody>
</table>

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