**Motivation and Broad Idea**

Zero-Shot Learning and Verb Attribute Embeddings

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<th>Translucence</th>
<th>Input</th>
<th>Model</th>
<th>Time</th>
<th>Social</th>
<th>Database</th>
<th>Effect on Arguments</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

Sample verb-attributes [2] for the activity verb “spray” from the Kitchen dataset

### Training with Short-Duration Macro-Activities

**Algorithm 1 Training the Zero-Shot Model**

**Input:** Training Set \( V = \{(u, a) : u \in X, a \in A\} \), where \( X \) is the accelerometer data and \( A \) is the set of short-duration macro-activity labels.

**Output** Trained zero-shot model \( Z \):

1. \( (S, A) = \text{redim_labelswise}(V, d) \) (We fix \( d = 2 \). Here, \( S \), which is the transformed accelerometer data with dimensions reduced to \( d \).)
2. \( Z = [] \)
3. for \( i = 1 \) to \( N \) \( do \)
   4. \( Z[i] = \text{train_model}(X, S, \text{verb_attribute}(A)(i, :)) \)
5. end for
6. return \( Z \)

**Finding Unknown Micro-Activities**

Finding zero-shot model as an array of classifiers

**Algorithm 2 Predicting Micro-Activities**

**Input** Accelerometer data \( T'_{t+\tau} \) for activities where \( \tau \geq 10s \) and the trained zero-shot model \( Z \).

**Output** Predicted micro-activities \( M_{t+\tau}^f \), where \( M_{t+\tau}^f = \{m_1, m_2, \ldots, m_n\} \), where \( n \) is the total number of micro-activities performed by the subject in the time duration \( [t, t+\tau] \).

1. \( \mathbf{W}_{t+\tau}^f = \text{change_point}(T'_{t+\tau}) \) (Here, \( \mathbf{W}_{t+\tau} \) is the set of change-point windows.)
2. \( M_{t+\tau}^f = \{\} \)

3. for each change window \( \omega \) in \( \mathbf{W}_{t+\tau}^f \) \( do \)

4. \( J_\omega = \text{average accelerometer data fro the window } \omega \)
5. \( \mathcal{J}_\omega = \text{redim}(J_\omega, d) \) (We fix \( d = 2 \))
6. \( m_\omega = \text{predict_micro_activities}(Z, \mathcal{J}_\omega) \) (Here, \( m_\omega \) is the micro-activity predicted for the change-window \( \omega \))
7. \( M_{t+\tau}^f = M_{t+\tau}^f \cup \{m_\omega\} \)
8. end for
9. return \( M_{t+\tau}^f \)

**Demonstration of Labeling Performance**

**References**


**Contact**

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