

A APPENDIX

Here we give an example of the input format of an element in our slides data. To simplify, we remove some duplicate properties and the actual text contents are hidden for privacy reasons.

```
1  {
2      "ShapeId": 0,
3      "ShapeType": 0,
4      "ZOrder": 1,
5      "Placeholder": 4,
6
7      "RotatedBound": {
8          "R_Top": 0.23333333333333334, "R_Left": 0.05,
9          "R_Right": 0.95, "R_Bottom": 0.9222222222222223,
10         "R_Width": 0.9, "R_Height": 0.6888888888888889
11     },
12
13     "FC_Solid": false, "FC_Pattern": false, "FC_Gradient": false,
14     "FC_R": 0, "FC_G": 0, "FC_B": 0, "FC_A": 0,
15
16     "FFlipX": false, "FFlipY": false,
17     "Rotation": 0.0,
18
19     "IsDesignElement": false, "IsConnector": false,
20     "IsDefaultShape": false, "IsEmptyShape": false,
21     "IsPlaceholder": true, "IsBackground": false,
22     "IsBackgroundFill": false, "IsChart": false, "IsDiagram": false,
23     "IsOrgChart": false, "IsE2o": false, "IsImage": false,
24     "IsGroup": false, "IsCustomGeom": false, "IsCallout": false,
25     "IsConnectorType": false, "IsTable": false,
26
27     "TextContent": {
28         "ParaInfos": [
29             {
30                 "Text": "For more information:", // hidden
31                 "Level": 0,
32                 "FontSize": 32.0,
33                 "IsBold": false, "IsItalic": false,
34                 "Underline": 0, "Strikethrough": 0,
35                 "IsHyperLink": false, "IsLatinFont": true,
36                 "IsEastAsianFont": true, "IsSymbolFont": false,
37                 "Bullet": 0, "IsComplexScriptFont": true,
38                 "Children": [],
39                 "LevelAgg": {"CharCount": 21, "WordCount": 3,
40                             "LineCount": 1},
41                 "ParaAgg": {"CharCount": 21, "WordCount": 3,
42                             "LineCount": 1}
43             },
44             {
45                 "Text": "http://www.servsafe.com", // hidden
46                 "Level": 0,
47                 "FontSize": 32.0,
48                 "IsBold": false, "IsItalic": false,
49                 "Underline": 2, "Strikethrough": 0,
50                 "IsHyperLink": true, "IsLatinFont": true,
51                 "IsEastAsianFont": true, "IsSymbolFont": false,
52                 "Bullet": 0, "IsComplexScriptFont": true,
53                 "Children": [],
54                 "LevelAgg": {"CharCount": 23, "WordCount": 1,
55                             "LineCount": 1},
56                 "ParaAgg": {"CharCount": 23, "WordCount": 1,
57                             "LineCount": 1}
58             }
59         ]
60     }
61 }
```

```
59         ]
60     }
61 }
```

An instance contains several shapes and we pre-process the data to obtain the model input. Specifically to produce a compressed and more informative *Type* property, we combine binary features indicating shape roles (e.g., *IsDesignElement*, *IsTable*, etc.) with the *ShapeType* feature. Furthermore, in this example, the element is a text box which has text contents in it displayed as *ParaInfos*. The *Children* here means the sub-text under the corresponding text, showing that the text box is displayed in a hierarchical structure. During data pre-processing, we organize the properties of each text line into a vector and use the averaged one to represent the text-related features of the element (e.g., *Font Size*, *Word Count*).