第五章 实验部分

前文提到，为了解决 GIF 情感分析的概念语义体系缺失的问题，我们提出了“情感对”以及一套基于“情感对”的概念语义体系；为了解决 GIF 情感分析的时序表示问题，我们提出了“情感对序列”；针对情感对序列的检测，我们提出了基于卷积神经网络的一套检测方法；针对情感倾向性的检测，我们提出了基于带长短期记忆单元的循环神经网络的一套检测方法；在本章中，我们首先通过实验验证我们提出的概念语义体系在 GIF 情感分析中的合理性；然后通过实验验证我们提出的情感对序列在 GIF 情感分析问题中的合理性；之后，我们通过实验验证了引入人脸识别后的效果；最后与现在最好的 GIF 情感识别方法进行了对比。

首先，我们介绍实验中用到的数据集，GIF 情感分析问题目前没有统一的数据集可以参考，因此，我们采用爬虫的方法从社交网络（主要是新浪微博）中采集了

5.1 GSO-2015数据集

GSO-2015数据集是我们从新浪微博中爬取到的一个 GIF 视频数据集，包括四万余张 GIF 动画，在这些视频中，我们人工标注了六千余张，其中有1700余张是有明确情感倾向的，其余的4300余张要么情感倾向受 GIF 动画中的文字影响，要么无法判断倾向。我们的人工标注信息我们的实验主要在1700余张有明确情感倾向的数据中进行。下表列出了 GSO-2015数据集的详细信息：

|  |  |
| --- | --- |
| 表5.1 GSO-2015 数据集概要 | |
| 总GIF视频数 | 41092 |
| 人工标注过的 GIF 视频数 | 6177 |
| 有明确情感倾向的 GIF 视频数 | 1740 |
| 积极情感倾向 GIF 视频数 | 1059 |
| 中性情感倾向 GIF 视频数 | 551 |
| 消极情感倾向 GIF 视频数 | 130 |



图 5.1 GSO-2015数据集

在 GSO-2015数据集中，我们不仅标注了 GIF 视频的最终情感倾向，而且还标注了 GIF 视频中含有的情感对信息,按照 GIF 视频帧中出现情感对的先后顺序，我们标注了 GIF 视频帧的情感对序列。如表5.2所示，是GSO-2015数据集的标注示例。

表5.2 GSO-2015标注示例



5.2 GIF 情感识别验证实验

为了综合评估我们提出的 GIF 情感分析概念体系结构和 GIF 情感分析时序模型在实际应用中的作用。我们设计了一系列的实验，其中实验5.2.1验证情感对提取算法的性能，实验5.2.2验证最终情感检测算法性能，实验5.2.3验证改进的情感对提取算法，实验5.2.4 验证改进的最终情感检测算法，实验5.2.5比较我们的方法与 ANP 在情感识别中的性能，实验5.2.6比较我们的方法与基于底层特征的情感识别方法的性能，实验5.2.7比较我们的方法与简单 CNN 网络在情感识别问题上的性能。

实验5.2.1 研究不同筛选算法对情感对提取性能的影响

如3.2节所述，我们构建了一个基于情感对的概念语义体系，该概念语义体系为带倾向性的GIF 视频内容划定了边界。该概念语义体系是树状结构，一层孩子结点有三个，分别是动词树，名词树和形容词树。其中动词树中包含了大量动词，名词树和形容词树中分别包含了大量名词和形容词。这些树中的动词，名词和形容词按照上下位关系组织起来，例如在动词树中有一个动作结点（action），该节点的子节点描述的是一些动作，例如击打，坠落和翻转等等，名词树中包含一个动物节点，该节点的子节点是一些动物的名称，例如猫，狗，大象等等。形容词树比较特殊，因为形容词并不具有上下位关系，因此形容词树有两个一级节点，积极倾向形容词和消极倾向形容词，每个一级节点下对应的分别是积极和消极倾向的形容词。在树的构建过程中，动词和名词的上下位关系来自普林斯顿大学的研究成果—词网（WordNet）.词网的构建是由许多语言学家和领域专家[33]共同参与完成的.形容词树中所有形容词的倾向性信息则来自 Andrea 等人[47]的研究成果 SentiWordNet, SentiWordNet 是采用众包的形式对 WordNet 中所有词进行人工标注后得到的。【此处可添加一些 WordNet 和 SentiWordNet构建过程的概述】



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