

失语症患者字幕媒体改编

持续存在的访问障碍与新兴的设计实践

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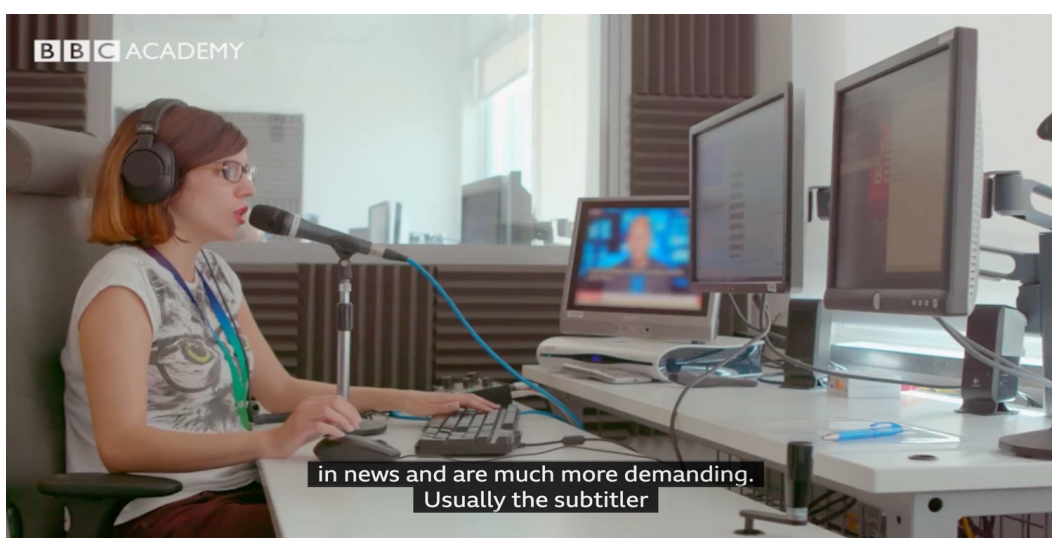


图 1: 传统的字幕显示在 BBC。

摘要

通过电视、笔记本电脑和智能手机消费字幕有可能基于人们复杂的无障碍需求将某些人边缘化。目前这种一刀切的无障碍辅助方法已经不再适用，需要研究如何根据个人环境、内容和个人使用习惯对其进行个性

化调整。例如，患有失语症的人在理解字幕文本时会遇到重大挑战。

我们将我们的工作视为一种呼吁行动，旨在推动更加包容的实践，重点在于如何将失语症患者的思想和意见纳入媒体研究。我们的工作探讨了如何为失语症患者开发未来的媒体解决方案，以创建一个更具包容性的媒体观看环境。我们相信实现这一目标的关键是适当的原型工具和方法，以便在系统设计过程中实现公平的包容。



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CCS Concepts

• **Human-centered computing** → **Accessibility technologies**; *Empirical studies in accessibility*; *Accessibility design and evaluation methods*.

Keywords

字幕、隐藏式字幕、自适应媒体、失语症、参与设计、无障碍干预

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1 当前现实：最先进的字幕可访问性研究

字幕/隐藏式字幕¹将电影/电视中的口语内容文本化 [31]，并传统上显示为屏幕底部中央带有黑色背景的白色文字 [4]，如 BBC 指南所建议，示例如图 1。然而，由于字幕显示采用了一刀切的方法以及字幕与媒体中的时间戳直接关联的时间性特征，并非所有人都能平等地访问这些内容。

字幕的呈现方式受到了广泛的研究，过去三十年的工作重点是为所有用户改进这一方面。1995 年，Brett [5] 使用点击解释复杂字词的方法来增强人们的听力技能。大约十年后，Rashid 等人 [25] 设计了传达说话人情感的动画字幕。到了 2020 年代，外部技术和替代模式开始受到考虑，例如使用人们的眼球注视位置来判断字幕的位置 [14]，以及将字幕音频翻译成可以在聋哑和听力障碍 (DHH) 人士的手腕上感觉到的振动 [35]。

在创建沉浸式界面字幕时，必须考虑其他因素。近年来，BBC 研究与开发提出了虚拟现实空间中的四种字幕行为 [6] 并确定 头部移动字幕 [7] 位于视线下方 12.5 度 [26] 是用户研究的最佳位置。

¹字幕 (CC) 还提供了声音效果的文本描述。大多数流媒体网站只有“英语 [CC]”这一种英文字幕选项，因此在这项工作中，我们将两者统称为字幕。

2 未来展望：开发可访问的字幕媒体

受当前字幕可访问性研究现状的启发，我们探索无障碍字幕媒体的未来视角。本节讨论了我们的研究目标人群以及在媒体消费过程中提升用户体验和舒适度的策略。

2.1 关注社区

失语症是由中风引起的语言和交流障碍，可能会影响一个人的理解、说话、阅读、写作以及使用数字的能力 [28]。这至少影响了英国的 35 万人 [1]，他们在家中和工作场所参与日常活动时面临挑战 [12, 24]，这些问题近年来已被来自多个角度的研究人员所关注。例如，替代和辅助沟通 (AAC) 策略 [17] 已被采用通过可穿戴设备来支持他们的交流 [9, 11]。

患有失语症的人在重新排列词语以形成新句子 [19]、制作漫画条 [29] 和绘画 [18] 等数字内容创作技能也得到了利用。虽然先前的研究为人们理解失语症患者遇到的多种可访问性挑战提供了宝贵的见解，但仍需确保他们能够访问带有字幕的媒体。此外，在字幕空间内，无障碍研究的关注度有所增加 [21]，但其中没有一项研究专注于失语症社区。鉴于包容性数字访问日益重要以及字幕显示的复杂性，理解满足其需求的字幕适应挑战至关重要。

2.2 设计思维和共同设计

为了开发出能够改善患有失语症的人对字幕媒体的参与度和理解力的定制解决方案，已经提出了结合 **双钻设计思维** [13] 和 **协同设计** [27] 方法的建议。在我们的工作中，我们计划在整个设计、开发和评估可访问性干预措施的过程中涉及最终用户。这一策略近年来引起了关注，研究人员一直致力于解决老年人 [16, 33] 和残疾群体（如视力障碍 [23, 34]、听力损失 [34]、失语症患者 [10, 20] 以及痴呆症患者 [15]）所面临的无障碍挑战。

为了开发出适当的数据艺术作品,我们需要正确理解我们试图通过尝试获取当前他们在消费字幕时面临的挑战的见解来解决的问题。这可以通过与言语和语言治疗师 (SLTs) [22] 进行探索性访谈,并对失语症患者进行结构合理的封闭式问题调查 [3] 来实现,其中发现可以综合起来设计字幕适应干预指南以满足失语症患者的需求。设计指导指出了解决方案的“正确性”,之后将开始实施。

在我们的工作中,计划使用眼动追踪设备² [30] 来监控用户的当前屏幕焦点,并随后利用这一点来理解我们创建系统的整体效果。将考虑水平原型 [2] 策略,因为我们的解决方案可能包含许多独立/松散相关的特征,这些特征将迭代开发。一旦系统中的大多数功能都能正常工作,我们将对原型进行评估。这包括收集定量和定性数据的混合体,突出在开发辅助失语症患者消费字幕媒体内容的系统中面临的挑战和机遇。我们的干预措施将以成对的方式与其他现有的无障碍干预措施进行比较(即用户选择两者之一或保持中立) [32],并通过半结构化访谈 [8] 补充,允许他们详细阐述他们的回应。

3 结论

在我们的工作中,我们旨在提高失语症患者消费字幕媒体内容的能力。我们在人机交互研究方面做出了三个主要贡献 [36]。首先,从对言语语言治疗师的调查和访谈中获得的见解使我们能够起草用户需求并为字幕改编干预设计建议,这对应于经验性和理论性贡献的结合。我们的第二个贡献在于开发和实现了一个高保真原型,该原型个性化和定制了专为失语症患者设计的字幕媒体。最后的经验性贡献将基于从捕捉失语症患者与我们的无障碍干预交互体验中收集的数据得出的发现。

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²<https://www.tobii.com/products/eye-trackers>

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