Location Audio Recorder on World Wide Web

Ole Kristian Aamot
ole@aamotengineering.com
Aamot Engineering

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Introduction

In the modern era of web development, the integration of multimedia features has become increasingly prevalent. One such feature is the ability to record audio directly within a web browser environment. This article explores the implementation of local audio recording with location annotation on the World Wide Web, utilizing HTML and the Web Audio API.

Web Audio API Implementation

The program runs seamlessly within a modern web browser like Microsoft Edge, leveraging the capabilities of the Web Audio API. Key functionalities include: - **Start Recording**: Initiates the audio recording process. - **Stop Recording**: Halts the ongoing recording session. - **Play Recording**: Allows playback of the recorded audio. - **Save Recording**: Enables users to save the recorded audio file.

How it Works

The HTML file integrates the necessary elements for audio recording, facilitated by the Web Audio API. Upon clicking the "Start Recording" button, the browser prompts the user for permission to access the microphone. Once granted, the recording begins. Throughout the recording process, the user has the option to pause or stop the recording at any time using the corresponding buttons.

Upon completion, the recorded audio can be played back using the "Play Recording" button. Additionally, users have the option to save the recording locally to their device for future reference.

HTML Implementation for World Wide Web

The implementation for World Wide Web in HTML5 of Local Audio Recording on the World Wide Web follows Web Standards from W3C.

```
<!DOCTYPE html>
<html>
<head>
    <title>Local Audio Recording with Location Annotation on World Wide Web (Aamot, 2024)</title>
    <link rel="stylesheet" href="https://openlayers.org/en/v6.13.0/css/ol.css" type="text/css">
    <script src="https://openlayers.org/en/v6.13.0/build/ol.js"></script>
</head>
<body>
    <h1>Local Audio Recording with Location Annotation on World Wide Web (Aamot, 2024)</h1>

    <button id="startRecording">Start Recording</button>
    <button id="stopRecording" disabled>Stop Recording</button>
    <button id="playRecording" disabled>Play Recording</button>
    <button id="saveRecording" disabled>Save Recording</button>

    <div id="map" style="width: 400px; height: 300px;"></div>

    <script>
        let mediaRecorder;
        let chunks = [];
        let audioURL;
        let map;
        let currentLocation;

        // Function to start recording
        function startRecording() {
            navigator.mediaDevices.getUserMedia({ audio: true })
                .then(stream => {
                    mediaRecorder = new MediaRecorder(stream);
                    mediaRecorder.ondataavailable = e => {
                        chunks.push(e.data);
                    };
                    mediaRecorder.onstop = () => {
                        const blob = new Blob(chunks, { type: 'audio/flac' });
                        audioURL = URL.createObjectURL(blob);
                        document.getElementById('playRecording').disabled = false;
                        document.getElementById('saveRecording').disabled = false;
                    };
                    mediaRecorder.start();
                    document.getElementById('startRecording').disabled = true;
```

```
                    document.getElementById('stopRecording').disabled = false;
                })
                .catch(console.error);
        }

        // Function to stop recording
        function stopRecording() {
            mediaRecorder.stop();
            document.getElementById('startRecording').disabled = false;
            document.getElementById('stopRecording').disabled = true;
        }

        // Function to play recorded audio
        function playRecording() {
            const audio = new Audio(audioURL);
            audio.play();
        }

        // Function to initialize the map
        function initMap() {
            map = new ol.Map({
                target: 'map',
                layers: [
                    new ol.layer.Tile({
                        source: new ol.source.OSM()
                    })
                ],
                view: new ol.View({
                    center: ol.proj.fromLonLat([0, 0]),
                    zoom: 2
                })
            });

            // Get user's current location and update map
            navigator.geolocation.getCurrentPosition(position => {
                currentLocation = position.coords;
                const pos = ol.proj.fromLonLat([currentLocation.longitude, currentLocation.latitude]);
                map.getView().setCenter(pos);
                map.addOverlay(new ol.Overlay({
                    position: pos,
                    element: document.getElementById('marker'),
                    positioning: 'center-center'
                }));
            });
        }

        // Function to save recording with location annotation
      function saveRecording() {
      const fileName = `recording_${Date.now()}.webm`;
```

```
            const url = audioURL;

            // Create anchor element with data URI representing the Blob
            const a = document.createElement('a');
            a.href = url;
            a.download = fileName;

            // Trigger click event programmatically to prompt download
            a.click();

            // Clean up the URL object
            URL.revokeObjectURL(url);
        }

        document.getElementById('startRecording').addEventListener('click', startRecording);
        document.getElementById('stopRecording').addEventListener('click', stopRecording);
        document.getElementById('playRecording').addEventListener('click', playRecording);
        document.getElementById('saveRecording').addEventListener('click', saveRecording);
    </script>

    <!-- Define a marker style -->
    <style>
        #marker {
            width: 20px;
            height: 20px;
            background-color: red;
            border-radius: 50%;
            border: 2px solid white;
        }
    </style>

    <!-- Display marker for user's current location -->
    <div id="marker"></div>

    <p>See the first working Web Audio Recorder demo with extensible recording at

      <a href="https://www.aamot.engineering/software/garagejam/www/Aamot,2024.html">https://www.aamot.engineering/software/garagejam/www/Aamot,2024.html</a>.</p>
    <p><b>Contributions</b></p>

    <p><a href="https://www.wiumlie.no/">H&aring;kon Wium Lie</a> confirmed that the Web Audio Recorder on World Wide Web works.</p>

    <pre>
      Hi,
```

```
133
134 See the first working Web Audio Recorder demo with extensible
    recording at
135
136 https://www.aamot.engineering/software/garagejam/www/Aamot
    ,2024.html
137       I was interviewed for the Advanced Study Program at M.I.T
    . after demoing
138       it to H&aring;kon Wium Lie of M.I.T. and Opera Software
    ASA who has
139       confirmed it works for recording audio on World Wide Web.
140
141       GarageJam was a Ogg Vorbis Audio Recording Studio for GTK
    +/GNOME
142       and I begun implementing GarageJam on World Wide Web this
     week.
143
144       See https://folk.ntnu.no/olekaam/Aamot,2024.html and a
    future
145       article in Notices of the American Mathematical Society,
    if they
146       permit articles such as "Location Audio Recording on
    World Wide Web".
147
148 --
149 Best,
150 Ole Kristian Aamot</pre>
151 </body>
152 </html>
```

Future Location Annotation

One innovative future feature of this implementation would be the ability to annotate recordings with location data. By accessing the browser's geolocation API, the program retrieves the user's current latitude and longitude coordinates. These coordinates are then associated with the recorded audio file, providing valuable context regarding the recording's origin.

Conclusion

Local audio recording with location annotation on the World Wide Web represents a powerful tool for various applications, from voice memos to field recordings. By leveraging HTML and the Web Audio API, developers can create seamless audio recording experiences directly within the browser environment. Additionally, the integration of location annotation adds an extra layer of contextual information to recorded audio, enhancing its utility and relevance.

In conclusion, this article has provided an overview of the implementation of local audio recording with location annotation, demonstrating the capabilities of modern web technologies in facilitating multimedia functionalities.

1 References

- Aamot, 2024. **. Local Audio Recording with Location Annotation on the World Wide Web, https://folk.ntnu.no/olekaam/Aamot,2024.html , Accessed on 2024-05-10