

**2018 Fall**  
**CTP431: Music and Audio Computing**

# **Intro to Web Audio and Sound Visualization**

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# Outlines

- AnalyzerNode
  - Waveform
  - Spectrum
- Microphone Input
- Canvas and 2D graphics
- Animation



# AnalyzerNode

- AudioNode for frame-based sound analysis
  - Input
    - Sample file
    - Microphone input
  - Output
    - Waveform
    - FFT
- References
  - <https://developer.mozilla.org/en-US/docs/Web/API/AnalyserNode> (AnalyzerNode)
  - <https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamAudioSourceNode> (Microphone input)

# 2D Graphics in HTML

- Canvas: `<canvas>` element
  - The code commands what/how to draw directly on pixels (bit-map)
  - Resolution dependent
  - No support for event handlers: not associated with DOM
  - Poor text rendering capabilities
  - You can save the resulting image as .png or .jpg
  - Well suited for graphic-intensive games
- References
  - [https://www.w3schools.com/graphics/canvas\\_intro.asp](https://www.w3schools.com/graphics/canvas_intro.asp)
  - [https://developer.mozilla.org/en-US/docs/Web/API/Canvas\\_API/Tutorial](https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API/Tutorial)

# 2D Graphics in HTML

- Scalable Vector Graphics (SVG): `<svg>` element
  - XML file format designed to create vector graphic
  - Create an internal model of the final output in memory
  - Resolution independent
  - Support for event handlers: associated with DOM
  - Best suited for applications with large rendering areas (e.g. Google Maps)
  - Slow rendering if complex (anything that uses the DOM a lot will be slow)
  - Not suited for game application
- References
  - [https://www.w3schools.com/graphics/svg\\_intro.asp](https://www.w3schools.com/graphics/svg_intro.asp)
  - <https://stackoverflow.com/questions/5882716/html5-canvas-vs-svg-vs-div>

# Animation

- Method 1
  - Using `window.requestAnimationFrame(callback func)`
  - 60 frame per sec or browser-independent
  - Frame rate control
    - <https://codepen.io/njmcode/pen/kmlpi>
- Method 2
  - Using `id = setInterval(callback function, rate)`
  - To reset the timer, `clearInterval(id)`
  - Reference: [https://www.w3schools.com/howto/howto\\_js\\_animate.asp](https://www.w3schools.com/howto/howto_js_animate.asp)
- Comparison
  - <https://stackoverflow.com/questions/38709923/why-is-requestanimationframe-better-than-setinterval-or-settimeout>

# Examples

- See the Github folder
  - <https://github.com/juhannam/ctp431-2018/tree/master/session2>

