# LÖVE Tunes Lowlevel Sound Synthese

vrld

GPN 10

## Disclaimer:

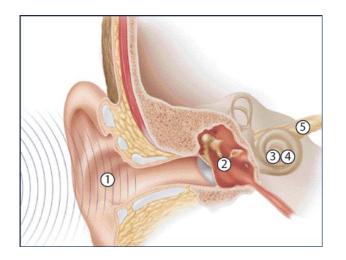
Ich habe eigentlich keine Ahnung, wovon ich rede.

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## Theorie :(

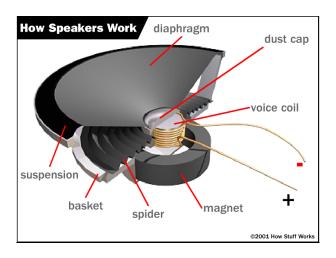
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## Schall



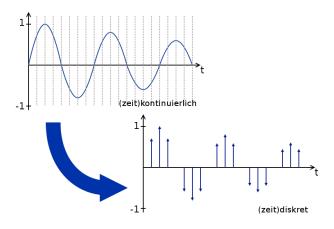
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### Lautsprecher



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### Abtastung



$$Samplerate = \frac{n_s}{t}$$

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### Nyquist-Shannon sampling theorem

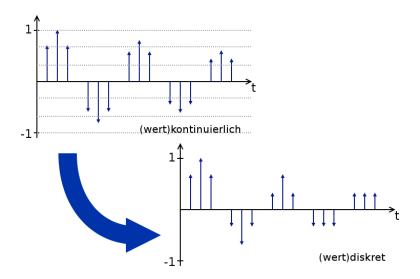




$$f_{max} = rac{1}{2} \cdot Samplerate$$

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### Quantisierung



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## Praxis!

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## Sprache



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#### **Toolkit**



www.love2d.org1

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<sup>&</sup>lt;sup>1</sup>,, What is up with the umlaut in LÖVE? We can't really say that we're making love, now can we? Plus, adding an umlaut makes anything awesome, just look at Motörhead." (ehemals http://love2d.org/faq)

#### Generierende Funktion

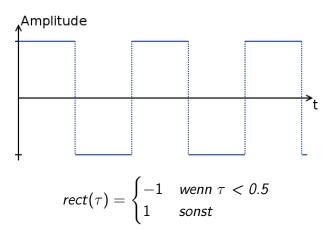


Generator:  $gen:[0,1] \rightarrow [-1,1]$ 

Basissignal:  $s(t) = gen((t \cdot f) \mod 1)$ 

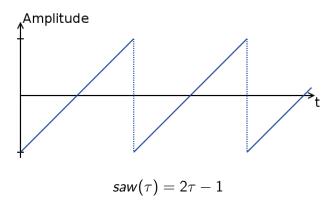
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#### Rechteck



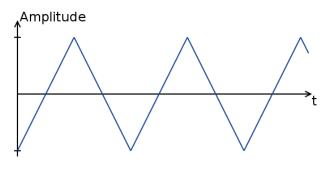
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## Sägezahn



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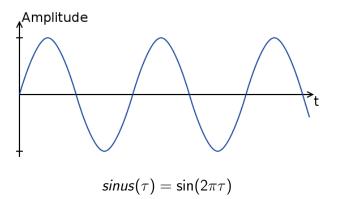
#### Dreieck



$$triangle( au) = egin{cases} 4 au - 1 & \textit{wenn } au < 0.5 \ 3 - 4 au & \textit{sonst} \end{cases}$$

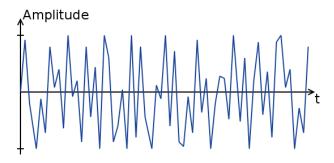
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#### Sinus



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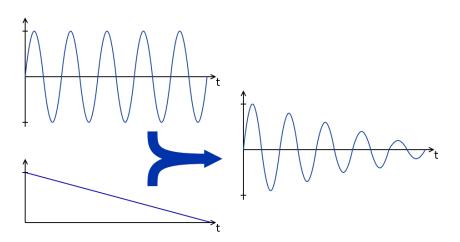
#### Rauschen



$$\mathit{whitenoise}(t) = \mathit{random}(-1,1)$$
  $\mathit{pinknoise}(t) = \mathit{random}(-1,1) + \mathit{letztes\ sample}$ 

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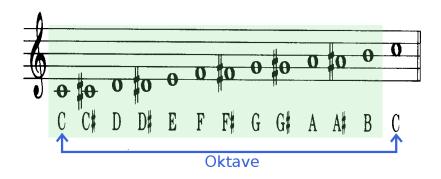
### Hüllkurven



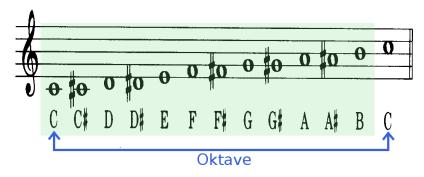
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## Mehr Theorie

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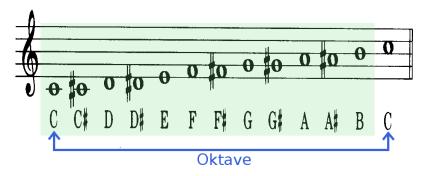


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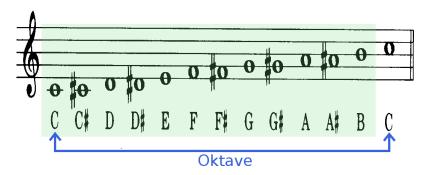
Oktave  $\sim$  Frequenzverdoppelung

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Oktave  $\sim$  Frequenzverdoppelung Halbtonschritt  $\sim$  12ter Teil einer Oktave

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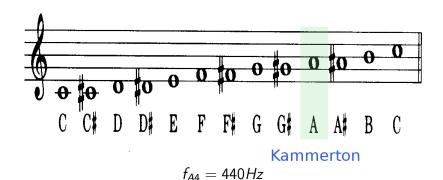


Oktave  $\sim$  Frequenzverdoppelung Halbtonschritt  $\sim$  12ter Teil einer Oktave

$$\Rightarrow \sqrt[12]{2}$$

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#### Kammerton



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#### Kammerton



#### Kammerton

$$f_{A4} = 440 Hz$$

$$f_{G\#4} = 440 Hz \cdot (\sqrt[12]{2})^{-1}$$
  
 $f_{G4} = 440 Hz \cdot (\sqrt[12]{2})^{-2}$ 

$$f_{A\#4} = 440 Hz \cdot (\sqrt[12]{2})^1$$
  
 $f_{B4} = 440 Hz \cdot (\sqrt[12]{2})^2$ 

. .

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## **ENDE**

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