Lecture 5 Sampling & Aliasing Part 1 The University of Texas at Austin 9,20,18 EE 313 Linear Systems and Signals Prof. Brian L. Evans Fall 2018 Question from a student concerning the parameters for a spectrogram Notes by Mr. Houshang Salimian By selecting a bigger window for spectrogram Freq. resolution is much more better. , (more details, Af= fs N \_ number of samples in 1 second For N=8000 in spectrogram7 Fs=8000 (HZ → Af= <u>8000,142,</u> 8000=1 shift determines what happens in time domain segment 1 shift segment 2 Slide 5-2 pressure waves Sampling Side Analog to Digital Conv. would add a low pass fitter Sample Microphone Amplitude digital X analog Continous time for discrete - time Quant Valtye signeds

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reconstruction side from last page digital. Discrete-Time analog Lowpass analso Filter discrete tinons Continous time Continous - Time time reduced time Conversion artifacts  $T_s \text{ or } f_s = \frac{1}{T_s}$ fs>2 fmax -> fmax 2 fs Digital to Analog Converter (DAC) reduce artifacts -> reduce content of Frequencies above and at 1 fs Slide 5-5 5-5  $X(t) = A \cos(\omega t + \phi)$ =  $A\cos(w(nT_s+\phi))$  $\chi[n] = \chi(t)$ t=nTs =  $A \cos((\omega T_s) \cap + \phi)$  $\hat{\omega} = \omega T_{5} = 2\pi f [rad/sample]$ Winh X and a lat

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