3-D Audio Taxonomy

"Everyday" Spatialization	Recording & Mixing	Processing	Reverb	Head-Related Transfer Function (HRTF)	Multi-speaker Spatialization
location/time/ phase Discern direction and spatial location from time relative to arrival time to each ear Discern relevant sound from noise ("Cocktail party" effect) --- space/ environment reverb/early refelctions Hass effect diffusive and absorptive qualities of materials	L/R (Left/Right) Stereo L/C/R (Left/ Center RIght) Quad (4 channels; basically double stereo; briefly popular in 1970s) X/Y microphone technique M-S (middle-side) microphone technique Binaural (dummy head recording)	Surround Sound (5.1, 6.1, etc; basically mono signals sent to different speakers) M-S decoding EQ/filtering usually no height information (10.2 surround is an exception) HRTF (binaural decoding)	Early reflections and decay times Convolution - FIR (finite impulse response)	Processing for binaural recordings popular in VR modeling of ear canal good localization of individual sound sources contains height info headphones	positioning of virtual sources to arbitrary directions (in 2d or 3d) - VBAP (Vector-based amplitude panning) - Ambisonics - Wave Field Synthesis (produces artificial wave fronts) all work with variable numbers of speakers but Wave Field requires a high number state of the art - accurate positioning (includes height)