

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS

(NOTES omitted)

INSTRUMENTS

G10 MUSICAL INSTRUMENTS; ACOUSTICS

(NOTES omitted)

G10L SPEECH ANALYSIS TECHNIQUES OR SPEECH SYNTHESIS; SPEECH RECOGNITION; SPEECH OR VOICE PROCESSING TECHNIQUES; SPEECH OR AUDIO CODING OR DECODING

NOTE

This subclass does not cover:

- devices for the storage of speech or audio signals, which are covered by subclasses [G11B](#) and [G11C](#);
- encoding of compressed speech signals for transmission or storage, which is covered by group [H03M 7/30](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

13/00	Speech synthesis; Text to speech systems	2015/027	. . {Syllables being the recognition units}
13/02	. Methods for producing synthetic speech; Speech synthesisers	15/04	. Segmentation; Word boundary detection
		15/05	. . Word boundary detection
2013/021	. . {Overlap-add techniques}	15/06	. Creation of reference templates; Training of speech recognition systems, e.g. adaptation to the characteristics of the speaker's voice (G10L 15/14 takes precedence)
13/027	. . Concept to speech synthesisers; Generation of natural phrases from machine-based concepts (generation of parameters for speech synthesis out of text G10L 13/08)	15/063	. . {Training}
13/033	. . Voice editing, e.g. manipulating the voice of the synthesiser	2015/0631	. . . {Creating reference templates; Clustering}
13/0335	. . . {Pitch control}	2015/0633 {using lexical or orthographic knowledge sources}
13/04	. . Details of speech synthesis systems, e.g. synthesiser structure or memory management	2015/0635 {updating or merging of old and new templates; Mean values; Weighting}
13/047	. . . Architecture of speech synthesisers	2015/0636 {Threshold criteria for the updating}
13/06	. Elementary speech units used in speech synthesisers; Concatenation rules	2015/0638 {Interactive procedures}
13/07	. . Concatenation rules	15/065	. . Adaptation
13/08	. Text analysis or generation of parameters for speech synthesis out of text, e.g. grapheme to phoneme translation, prosody generation or stress or intonation determination	15/07	. . . to the speaker
		15/075 {supervised, i.e. under machine guidance}
		15/08	. Speech classification or search
2013/083	. . {Special characters, e.g. punctuation marks}	2015/081	. . {Search algorithms, e.g. Baum-Welch or Viterbi}
13/086	. . {Detection of language}	15/083	. . {Recognition networks (G10L 15/142 , G10L 15/16 take precedence)}
13/10	. . Prosody rules derived from text; Stress or intonation	2015/085	. . {Methods for reducing search complexity, pruning}
2013/105	. . . {Duration}	2015/086	. . {Recognition of spelled words}
15/00	Speech recognition (G10L 17/00 takes precedence)	2015/088	. . {Word spotting}
15/005	. {Language recognition}	15/10	. . using distance or distortion measures between unknown speech and reference templates
15/01	. Assessment or evaluation of speech recognition systems	15/12	. . using dynamic programming techniques, e.g. dynamic time warping [DTW]
15/02	. Feature extraction for speech recognition; Selection of recognition unit	15/14	. . using statistical models, e.g. Hidden Markov Models [HMMs] (G10L 15/18 takes precedence)
2015/022	. . {Demisyllables, biphones or triphones being the recognition units}	15/142	. . . {Hidden Markov Models [HMMs]}
2015/025	. . {Phonemes, fenemes or fenones being the recognition units}	15/144 {Training of HMMs}

- 15/146 {with insufficient amount of training data, e.g. state sharing, tying, deleted interpolation}
- 15/148 {Duration modelling in HMMs, e.g. semi HMM, segmental models or transition probabilities}
- 15/16 . . using artificial neural networks
- 15/18 . . using natural language modelling
- 15/1807 . . . {using prosody or stress}
- 15/1815 . . . {Semantic context, e.g. disambiguation of the recognition hypotheses based on word meaning}
- 15/1822 . . . {Parsing for meaning understanding}
- 15/183 . . . using context dependencies, e.g. language models
- 15/187 Phonemic context, e.g. pronunciation rules, phonotactical constraints or phoneme n-grams
- 15/19 Grammatical context, e.g. disambiguation of the recognition hypotheses based on word sequence rules
- 15/193 Formal grammars, e.g. finite state automata, context free grammars or word networks
- 15/197 Probabilistic grammars, e.g. word n-grams
- 15/20 . Speech recognition techniques specially adapted for robustness in adverse environments, e.g. in noise, of stress induced speech ([G10L 21/02](#) takes precedence)
- 15/22 . Procedures used during a speech recognition process, e.g. man-machine dialogue
- 2015/221 . . {Announcement of recognition results}
- 15/222 . . {Barge in, i.e. overridable guidance for interrupting prompts}
- 2015/223 . . {Execution procedure of a spoken command}
- 2015/225 . . {Feedback of the input speech}
- 2015/226 . . {using non-speech characteristics}
- 2015/227 . . . {of the speaker; Human-factor methodology}
- 2015/228 . . . {of application context}
- 15/24 . Speech recognition using non-acoustical features
- 15/25 . . using position of the lips, movement of the lips or face analysis
- 15/26 . Speech to text systems ([G10L 15/08](#) takes precedence)
- 15/28 . Constructional details of speech recognition systems
- 15/285 . . {Memory allocation or algorithm optimisation to reduce hardware requirements}
- 15/30 . . Distributed recognition, e.g. in client-server systems, for mobile phones or network applications
- 15/32 . . Multiple recognisers used in sequence or in parallel; Score combination systems therefor, e.g. voting systems
- 15/34 . . Adaptation of a single recogniser for parallel processing, e.g. by use of multiple processors or cloud computing
- 17/00 Speaker identification or verification techniques**
- 17/02 . Preprocessing operations, e.g. segment selection; Pattern representation or modelling, e.g. based on linear discriminant analysis [LDA] or principal components; Feature selection or extraction
- 17/04 . Training, enrolment or model building
- 17/06 . Decision making techniques; Pattern matching strategies
- 17/08 . . Use of distortion metrics or a particular distance between probe pattern and reference templates
- 17/10 . . Multimodal systems, i.e. based on the integration of multiple recognition engines or fusion of expert systems
- 17/12 . . Score normalisation
- 17/14 . . Use of phonemic categorisation or speech recognition prior to speaker recognition or verification
- 17/16 . Hidden Markov models [HMM]
- 17/18 . Artificial neural networks; Connectionist approaches
- 17/20 . Pattern transformations or operations aimed at increasing system robustness, e.g. against channel noise or different working conditions
- 17/22 . Interactive procedures; Man-machine interfaces
- 17/24 . . the user being prompted to utter a password or a predefined phrase
- 17/26 . Recognition of special voice characteristics, e.g. for use in lie detectors; Recognition of animal voices
- 19/00 Speech or audio signals analysis-synthesis techniques for redundancy reduction, e.g. in vocoders; Coding or decoding of speech or audio signals, using source filter models or psychoacoustic analysis (in musical instruments G10H)**
- 2019/0001 . . {Codebooks}
- 2019/0002 . . . {Codebook adaptations}
- 2019/0003 . . . {Backward prediction of gain}
- 2019/0004 . . . {Design or structure of the codebook}
- 2019/0005 {Multi-stage vector quantisation}
- 2019/0006 {Tree or treillis structures; Delayed decisions}
- 2019/0007 . . . {Codebook element generation}
- 2019/0008 {Algebraic codebooks}
- 2019/0009 {Orthogonal codebooks}
- 2019/001 {Interpolation of codebook vectors}
- 2019/0011 . . . {Long term prediction filters, i.e. pitch estimation}
- 2019/0012 . . . {Smoothing of parameters of the decoder interpolation}
- 2019/0013 . . . {Codebook search algorithms}
- 2019/0014 {Selection criteria for distances}
- 2019/0015 {Viterbi algorithms}
- 2019/0016 . . . {Codebook for LPC parameters}
- 19/0017 . {Lossless audio signal coding; Perfect reconstruction of coded audio signal by transmission of coding error ([G10L 19/24](#) takes precedence)}
- 19/0018 . {Speech coding using phonetic or linguistic decoding of the source; Reconstruction using text-to-speech synthesis}
- 19/002 . Dynamic bit allocation ([for perceptual audio coders G10L 19/032](#))
- 19/005 . Correction of errors induced by the transmission channel, if related to the coding algorithm
- 19/008 . Multichannel audio signal coding or decoding using interchannel correlation to reduce redundancy, e.g. joint-stereo, intensity-coding or matrixing
- 19/012 . Comfort noise or silence coding
- 19/018 . Audio watermarking, i.e. embedding inaudible data in the audio signal

- 19/02 . . . using spectral analysis, e.g. transform vocoders or subband vocoders
- 19/0204 . . . {using subband decomposition}
- 19/0208 . . . {Subband vocoders}
- 19/0212 . . . {using orthogonal transformation}
- 19/0216 . . . {using wavelet decomposition}
- 19/022 . . . Blocking, i.e. grouping of samples in time; Choice of analysis windows; Overlap factoring
- 19/025 . . . Detection of transients or attacks for time/frequency resolution switching
- 19/028 . . . Noise substitution, i.e. substituting non-tonal spectral components by noisy source ([comfort noise for discontinuous speech transmission G10L 19/012](#))
- 19/03 . . . Spectral prediction for preventing pre-echo; Temporary noise shaping [TNS], e.g. in MPEG2 or MPEG4
- 19/032 . . . Quantisation or dequantisation of spectral components
- 19/035 . . . Scalar quantisation
- 19/038 . . . Vector quantisation, e.g. TwinVQ audio
- 19/04 . . . using predictive techniques
- 19/06 . . . Determination or coding of the spectral characteristics, e.g. of the short-term prediction coefficients
- 19/07 . . . Line spectrum pair [LSP] vocoders
- 19/08 . . . Determination or coding of the excitation function; Determination or coding of the long-term prediction parameters
- 19/083 . . . the excitation function being an excitation gain ([G10L 25/90 takes precedence](#))
- 19/087 . . . using mixed excitation models, e.g. MELP, MBE, split band LPC or HVXC
- 19/09 . . . Long term prediction, i.e. removing periodical redundancies, e.g. by using adaptive codebook or pitch predictor
- 19/093 . . . using sinusoidal excitation models
- 19/097 . . . using prototype waveform decomposition or prototype waveform interpolative [PWI] coders
- 19/10 . . . the excitation function being a multipulse excitation
- 19/107 . . . Sparse pulse excitation, e.g. by using algebraic codebook
- 19/113 . . . Regular pulse excitation
- 19/12 . . . the excitation function being a code excitation, e.g. in code excited linear prediction [CELP] vocoders
- 19/125 . . . Pitch excitation, e.g. pitch synchronous innovation CELP [PSI-CELP]
- 19/13 . . . Residual excited linear prediction [RELPE]
- 19/135 . . . Vector sum excited linear prediction [VSELPE]
- 19/16 . . . Vocoder architecture
- 19/167 . . . {Audio streaming, i.e. formatting and decoding of an encoded audio signal representation into a data stream for transmission or storage purposes}
- 19/173 . . . {Transcoding, i.e. converting between two coded representations avoiding cascaded coding-decoding}
- 19/18 . . . Vocoder using multiple modes
- 19/20 . . . using sound class specific coding, hybrid encoders or object based coding
- 19/22 Mode decision, i.e. based on audio signal content versus external parameters
- 19/24 Variable rate codecs, e.g. for generating different qualities using a scalable representation such as hierarchical encoding or layered encoding
- 19/26 . . . Pre-filtering or post-filtering
- 19/265 . . . {Pre-filtering, e.g. high frequency emphasis prior to encoding}
- 21/00** **Speech or voice signal processing techniques to produce another audible or non-audible signal, e.g. visual or tactile, in order to modify its quality or its intelligibility ([G10L 19/00 takes precedence](#))**
- 21/003 . . . Changing voice quality, e.g. pitch or formants
- 21/007 . . . characterised by the process used
- 21/01 . . . Correction of time axis
- 21/013 . . . Adapting to target pitch
- 2021/0135 {Voice conversion or morphing}
- 21/02 . . . Speech enhancement, e.g. noise reduction or echo cancellation ([reducing echo effects in line transmission systems H04B 3/20](#); [echo suppression in hands-free telephones H04M 9/08](#))
- 21/0208 . . . Noise filtering
- 2021/02082 {the noise being echo, reverberation of the speech}
- 2021/02085 {Periodic noise}
- 2021/02087 {the noise being separate speech, e.g. cocktail party}
- 21/0216 . . . characterised by the method used for estimating noise
- 2021/02161 {Number of inputs available containing the signal or the noise to be suppressed}
- 2021/02163 {Only one microphone}
- 2021/02165 {Two microphones, one receiving mainly the noise signal and the other one mainly the speech signal}
- 2021/02166 {Microphone arrays; Beamforming}
- 2021/02168 {the estimation exclusively taking place during speech pauses}
- 21/0224 Processing in the time domain
- 21/0232 Processing in the frequency domain
- 21/0264 . . . characterised by the type of parameter measurement, e.g. correlation techniques, zero crossing techniques or predictive techniques
- 21/0272 . . . Voice signal separating
- 21/028 . . . using properties of sound source
- 21/0308 . . . characterised by the type of parameter measurement, e.g. correlation techniques, zero crossing techniques or predictive techniques
- 21/0316 . . . by changing the amplitude
- 21/0324 . . . Details of processing therefor
- 21/0332 involving modification of waveforms
- 21/034 Automatic adjustment
- 21/0356 . . . for synchronising with other signals, e.g. video signals
- 21/0364 . . . for improving intelligibility
- 2021/03643 {Diver speech}
- 2021/03646 {Stress or Lombard effect}
- 21/038 . . . using band spreading techniques
- 21/0388 . . . Details of processing therefor
- 21/04 . . . Time compression or expansion
- 21/043 . . . by changing speed
- 21/045 . . . using thinning out or insertion of a waveform

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- 21/047 characterised by the type of waveform to be thinned out or inserted
- 21/049 characterised by the interconnection of waveforms
- 21/055 . . for synchronising with other signals, e.g. video signals
- 21/057 . . for improving intelligibility
- 2021/0575 . . . {Aids for the handicapped in speaking}
- 21/06 . Transformation of speech into a non-audible representation, e.g. speech visualisation or speech processing for tactile aids ([G10L 15/26 takes precedence](#))
- 2021/065 . . {Aids for the handicapped in understanding}
- 21/10 . . Transforming into visible information
- 2021/105 . . . {Synthesis of the lips movements from speech, e.g. for talking heads}
- 21/12 . . . by displaying time domain information
- 21/14 . . . by displaying frequency domain information
- 21/16 . . Transforming into a non-visible representation ([devices or methods enabling ear patients to replace direct auditory perception by another kind of perception A61F 11/04](#))
- 21/18 . . Details of the transformation process
- 25/00** **Speech or voice analysis techniques not restricted to a single one of groups [G10L 15/00](#) - [G10L 21/00](#) (muting semiconductor-based amplifiers when some special characteristics of a signal are sensed by a speech detector, e.g. sensing when no signal is present, [H03G 3/34](#))**
- 25/03 . characterised by the type of extracted parameters
- 25/06 . . the extracted parameters being correlation coefficients
- 25/09 . . the extracted parameters being zero crossing rates
- 25/12 . . the extracted parameters being prediction coefficients
- 25/15 . . the extracted parameters being formant information
- 25/18 . . the extracted parameters being spectral information of each sub-band
- 25/21 . . the extracted parameters being power information
- 25/24 . . the extracted parameters being the cepstrum
- 25/27 . characterised by the analysis technique
- 25/30 . . using neural networks
- 25/33 . . using fuzzy logic
- 25/36 . . using chaos theory
- 25/39 . . using genetic algorithms
- 25/45 . characterised by the type of analysis window
- 25/48 . specially adapted for particular use
- 25/51 . . for comparison or discrimination
- 25/54 . . . for retrieval
- 25/57 . . . for processing of video signals
- 25/60 . . . for measuring the quality of voice signals
- 25/63 . . . for estimating an emotional state
- 25/66 . . . for extracting parameters related to health condition ([detecting or measuring for diagnostic purposes A61B 5/00](#))
- 25/69 . . for evaluating synthetic or decoded voice signals
- 25/72 . . for transmitting results of analysis
- 25/75 . for modelling vocal tract parameters
- 25/78 . Detection of presence or absence of voice signals ([switching of direction of transmission by voice frequency in two-way loud-speaking telephone systems H04M 9/10](#))
- 2025/783 . . {based on threshold decision}
- 2025/786 . . . {Adaptive threshold}
- 25/81 . . for discriminating voice from music
- 25/84 . . for discriminating voice from noise
- 25/87 . . Detection of discrete points within a voice signal
- 25/90 . Pitch determination of speech signals
- 2025/903 . . {using a laryngograph}
- 2025/906 . . {Pitch tracking}
- 25/93 . Discriminating between voiced and unvoiced parts of speech signals ([G10L 25/90 takes precedence](#))
- 2025/932 . . {Decision in previous or following frames}
- 2025/935 . . {Mixed voiced class; Transitions}
- 2025/937 . . {Signal energy in various frequency bands}
- 99/00** **Subject matter not provided for in other groups of this subclass**