



StirMark and profiles: from high end up to preview scenarios

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Structure



-
- Motivation
 - Evaluation profiles
 - Profile example
 - Evaluation parameters
 - Implementation
 - Conclusion



Motivation



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- Evaluation of digital watermarking algorithms important research field
 - Typical:
 - Lossy compression
 - DA/AD conversion
 - Time- / pitch scale
 - Single attacks
 - Possible attacks:
 - Normal use of audio content
 - Potential attacker tries to destroy the watermark
 - WET is benchmarking system for images
 - Edward J. Delp, Purdue University



Evaluation profiles



-
- Description of real world or attacker scenarios
 - Specify embed/retrieve and evaluation process
 - Subdivision: main profiles, sub-profiles



Main profiles



-
- Low Quality Robust
 - E.g. preview of virtual goods, telephony ...
 - Low Quality Fragile
 - Quality is not an essential parameter
 - High Quality Robust
 - E.g. CD, DVD and transparency most important
 - High Quality Fragile
 - Transparency is very important and has to be ensured



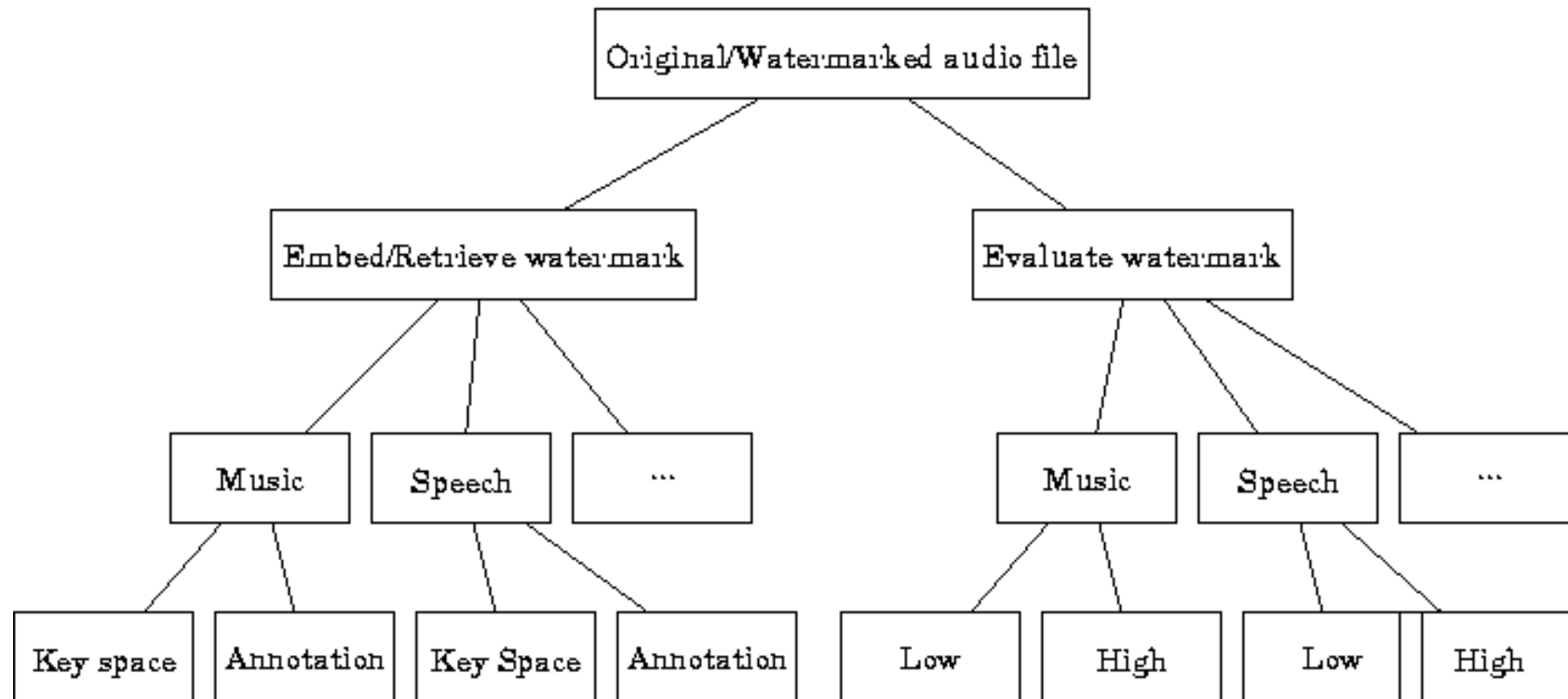
Sub-Profiles



-
- Annotation
 - Key space
 - Coalition resistance
 - Long time
 - DA/AD
 - Hidden communication
 - Calculation time
 - Lossy compression rates
 - Degree of fragility



Subjection of profiles





Profiles for embed, evaluation



	Embed or Retrieval	Evaluation
Low quality robust	X	X
Low quality fragile	X	X
High quality robust	X	X
High quality fragile	X	X
Annotation	X	
Key space	X	X
Coalition resistance		X
Long time	X	X
DA/AD		X
Hidden communication		X
Calculation time	X	X
Lossy compression rates		X
Degree of fragility		X



Attacks for Main Profiles



Relevant attacks	HQR	HQF	LQR	LQF
AddBrumm			X	X
AddDynNoise			X	X
AddFFTNoise			X	X
AddNoise			X	X
AddSinus	X	X	X	X
Amplify	X	X	X	X
BassBoost			X	X
Compressor			X	X
CopySample			X	
CutSample			X	
Echo			X	X
Exchange			X	X
ExtraStereo	X	X	X	X
...



WM parameters for the profiles

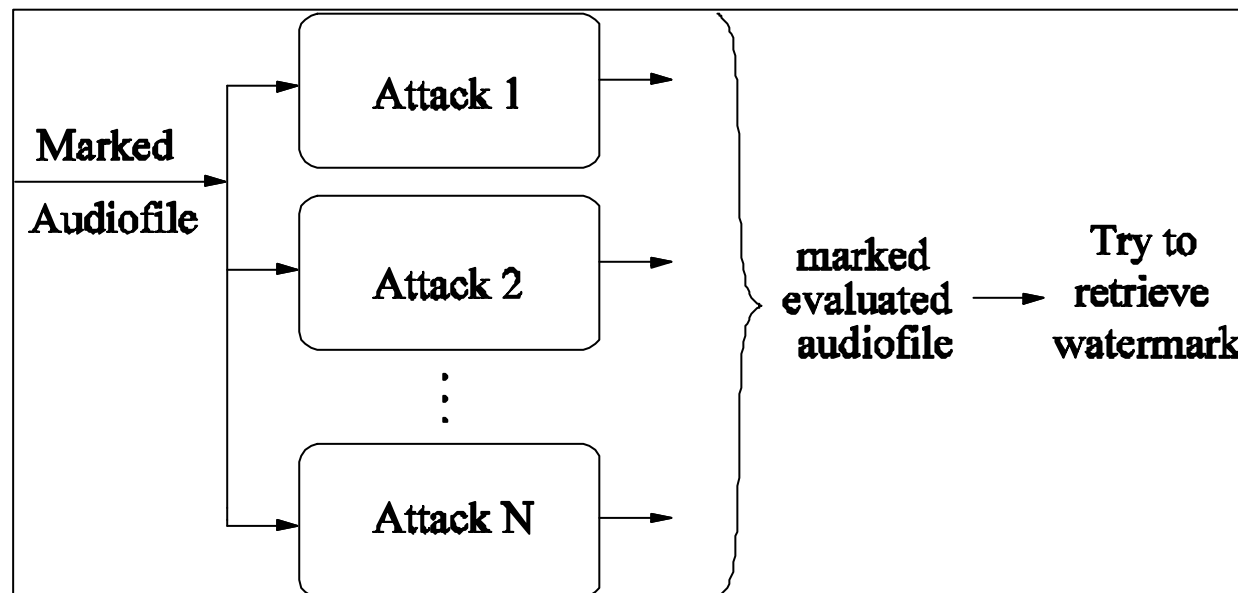


- **Fragility:**
 - Only relevant for the two profiles *high quality fragile* and *low quality fragile*.
 - If the watermark in such a profile should be evaluated, then the fragility should be determined with the sub-profile *degree of fragility*.
- **Transparency:**
 - Important parameter for *high quality robust* as well as *high quality fragile* profile.
 - Transparency of the embedding/retrieval and evaluation process is very important and should not be injured
- **Capacity:**
 - Relevant for the *high quality robust*, *high quality fragile*, *low quality robust*, *low quality fragile*, *annotation*, *long time*, *hidden communication* and *calculation* profiles.
 - These profiles measure and compare the capacity of the watermarking algorithms.
 - Only useable for embedding/retrieval profiles
- **Security:**
 - Relevant for the profiles *coalition resistance*, *key space* or *hidden communication*.
- **Invertible:**
 - Important for using the *high quality robust* or *high quality fragile* profile.
 - Highest possible quality is available.
- **Complexity:**
 - Important for the *calculation time* profile.
 - The complexity itself is important for real time application and hardware producers.



Implementation

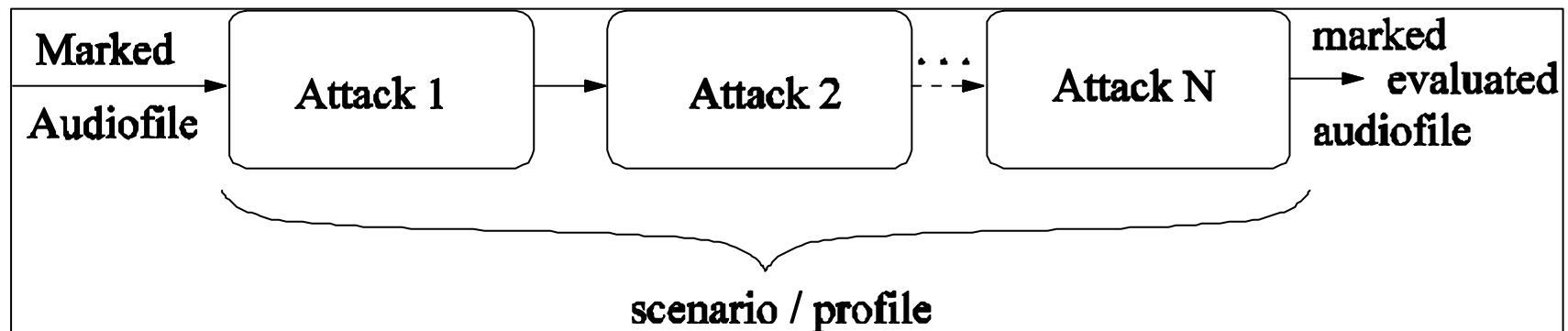
Usage of StirtMark for Audio





Implementation II

Principles of scenarios





Conclusion



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- Envisaged 4 main and 9 sub profiles
 - Using with StirMark for Audio
 - Profiles are the combination of single attacks
 - Hard work is to find the order and best parameter setting of the single attacks
 - Increase the number of profiles
 - Integration of Profiles into WET