RV

Real Time Visual Feedback Voice Training System for Teachers

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Web-supported Learning and Teaching

Teaching & Learning Symposium

17 May 2004

RV Real Time Visual Feedback VoiceTraning System

Agenda

- Prevalent voice problems among teachers
- RV's assistance in voice training
- RV in depth
  - Basic Flow
  - Theory – Singer's Formant/Resonance
  - Tutorials

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Voice problems among teachers

- Inability to project loudly
  - Too crowded and noisy classes
  - Incorrect voice usage
- Traditional solutions
  - Stress their vocal cords to project louder
  - Buy an expensive microphone

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Voice problems among teachers

- Vocal abuse
  - any behavior that strains or injures the vocal cords
  - E.g. excessive talking, screaming or yelling
- Vocal misuse
  - improper voice usage
  - E.g. speaking too loudly or at an abnormally high or low pitch

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Voice problems among teachers

- Prolonged damage to voice
  - Damage the vocal folds
  - Cause temporary or permanent changes in vocal function, voice quality, and possible loss of voice
- Affect the medium and quality of teaching
- Culprit: unawareness in voice usage

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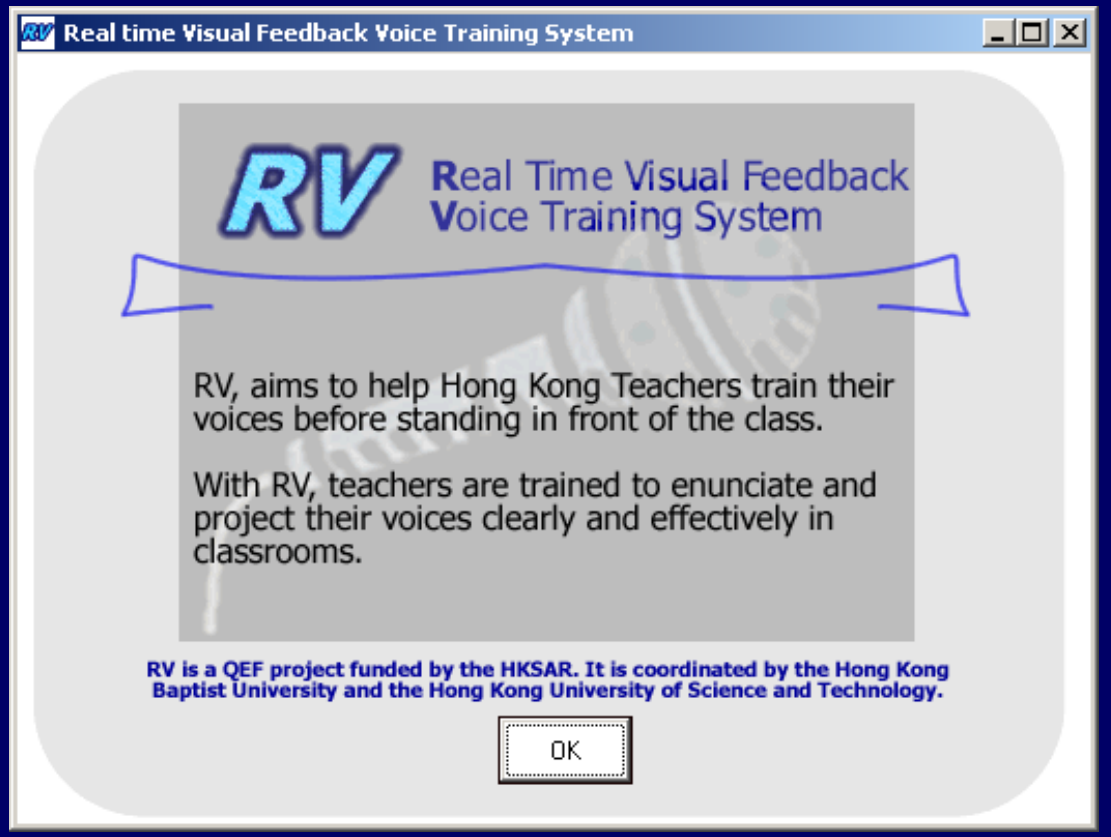
RV - Objective

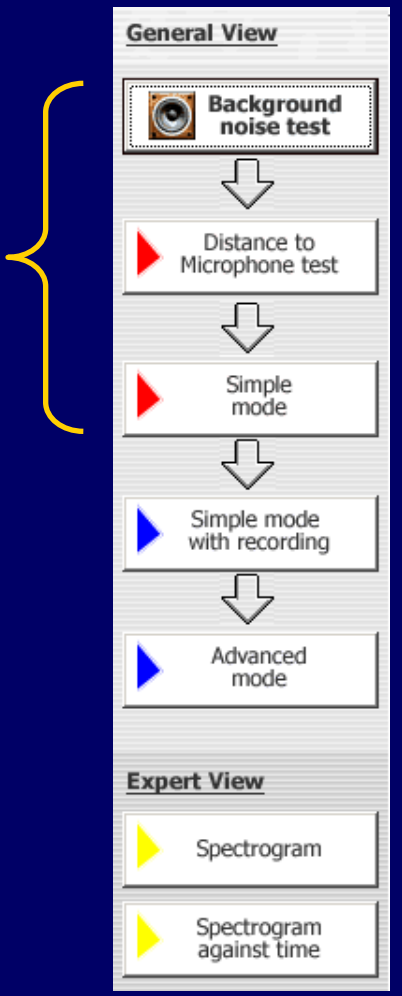
- Promote the awareness of teachers in correct voice usage
- Assist teachers (visually) in making good voices



Real Time Visual Feedback
VoiceTraning System

RV – Basic Flow

- Basic tests and analysis
  - Background noise test
  - Distance to microphone test
  - Simple voice analysis (simple mode)
- Target at beginners, with simple instructions



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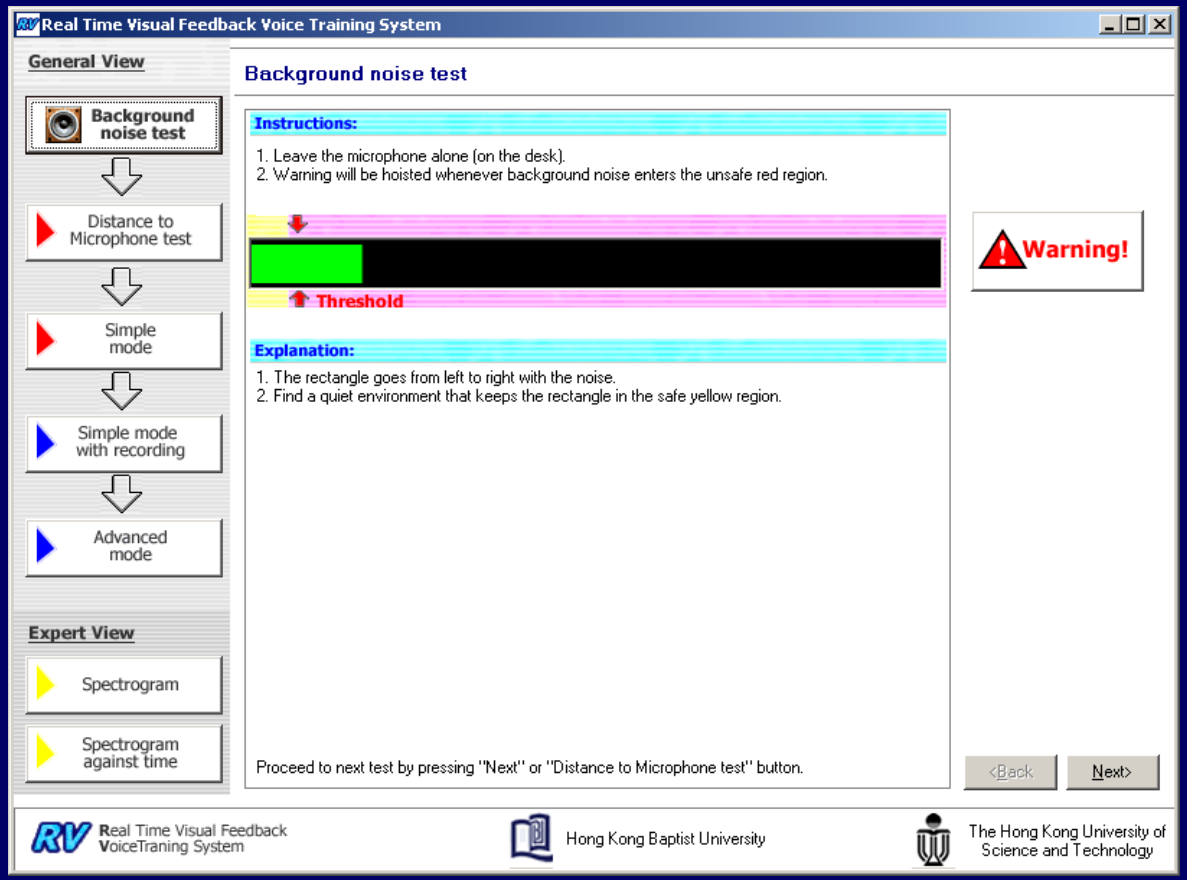
Background noise test

- Reduce background distractions
- Keep signal in yellow region
- Beware of “warning”



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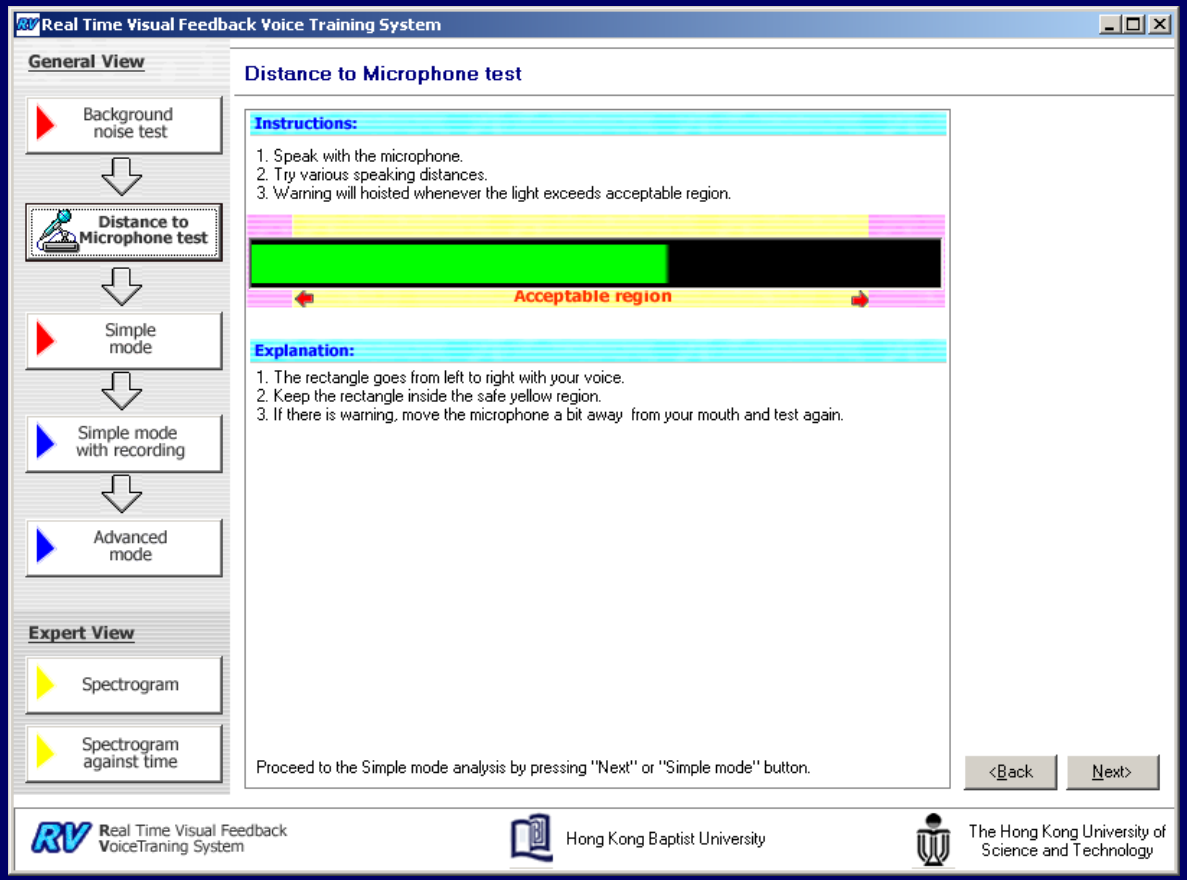
Distance to microphone test

- Avoid clipping (too big sound)
- Keep signal within acceptable region
- Beware of “warning”



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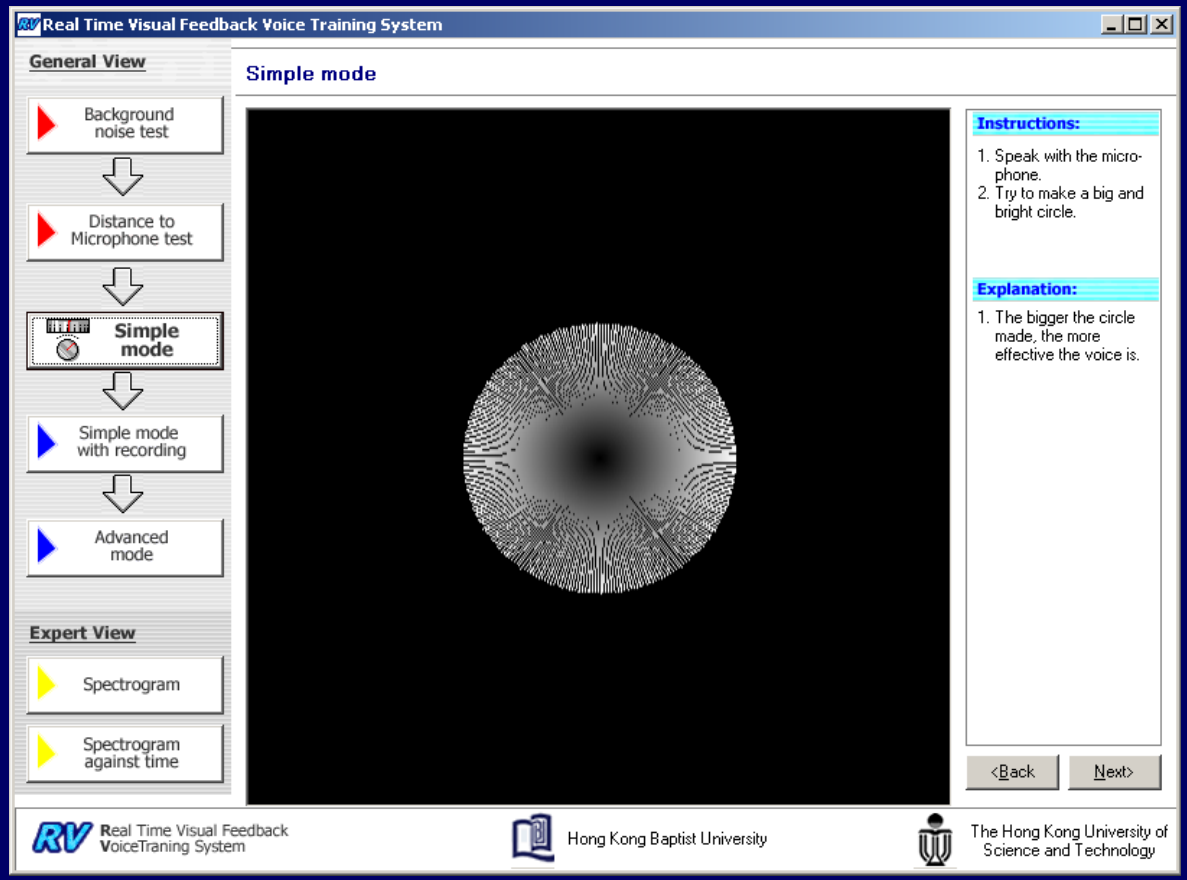
Simple mode

- Instruction
  - get a big circle
- Explanation
  - the bigger the circle, the more effective voice made



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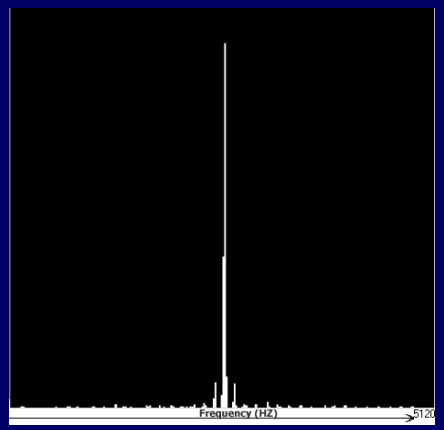
Singer's formant

- Analysis the sound in frequency domain
  - Lower freq. at left while higher freq. at right
- When we whistle or play some notes from the piano
  - has a specific freq., i.e. a peak is shown only
- How about when we speak or sing?
- Demo



Our whistling

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Singer's formant

- Singer's formant/resonance
  - from 2.2KHz to 3.8KHz
  - A singer, like a soprano, can be heard clearly, even she is singing with an Orchestra with over 50 musical instruments?
- Singing/speaking falls within this range, will be the most effective

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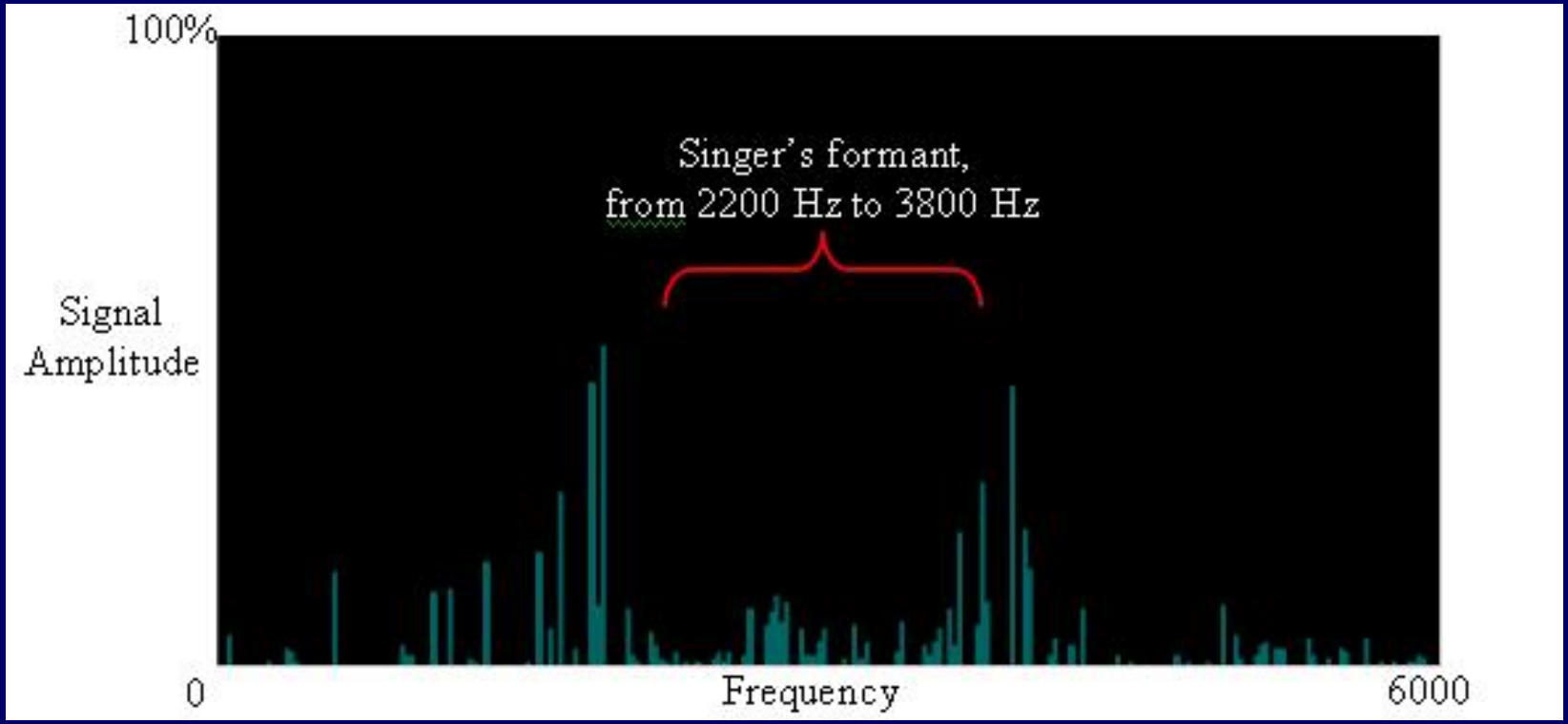
Singer's formant



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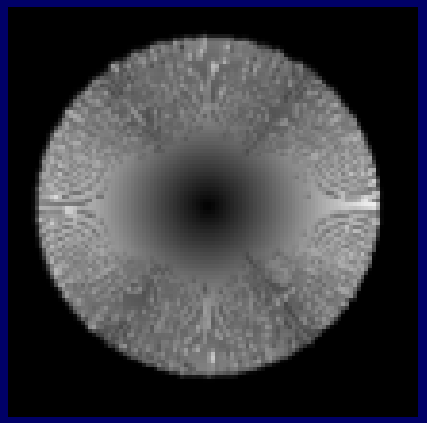
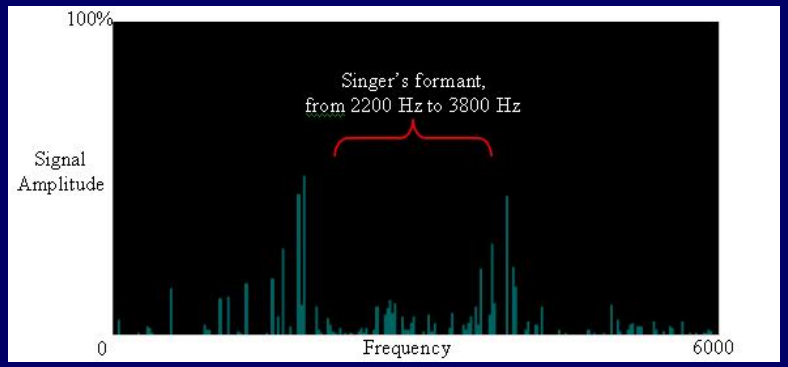
Singer's formant

Radius of the circle = bands within singer's formant range out of total bands





- Similarly, it can be interpreted as the level of energy in the singer's formant range attained

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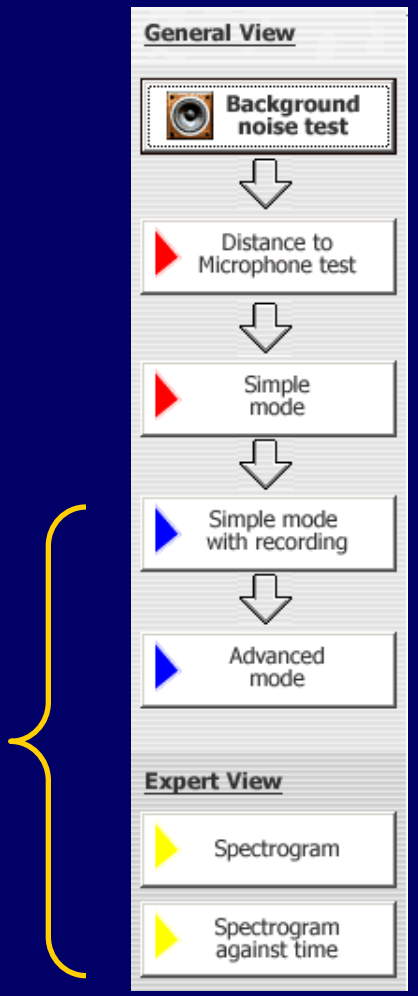
RV – Basic Flow, cont'd

- Further analysis
  - Simple mode with recording
  - Advanced mode
  - Expert view
- Target at more knowledgeable users, with more functionality provided



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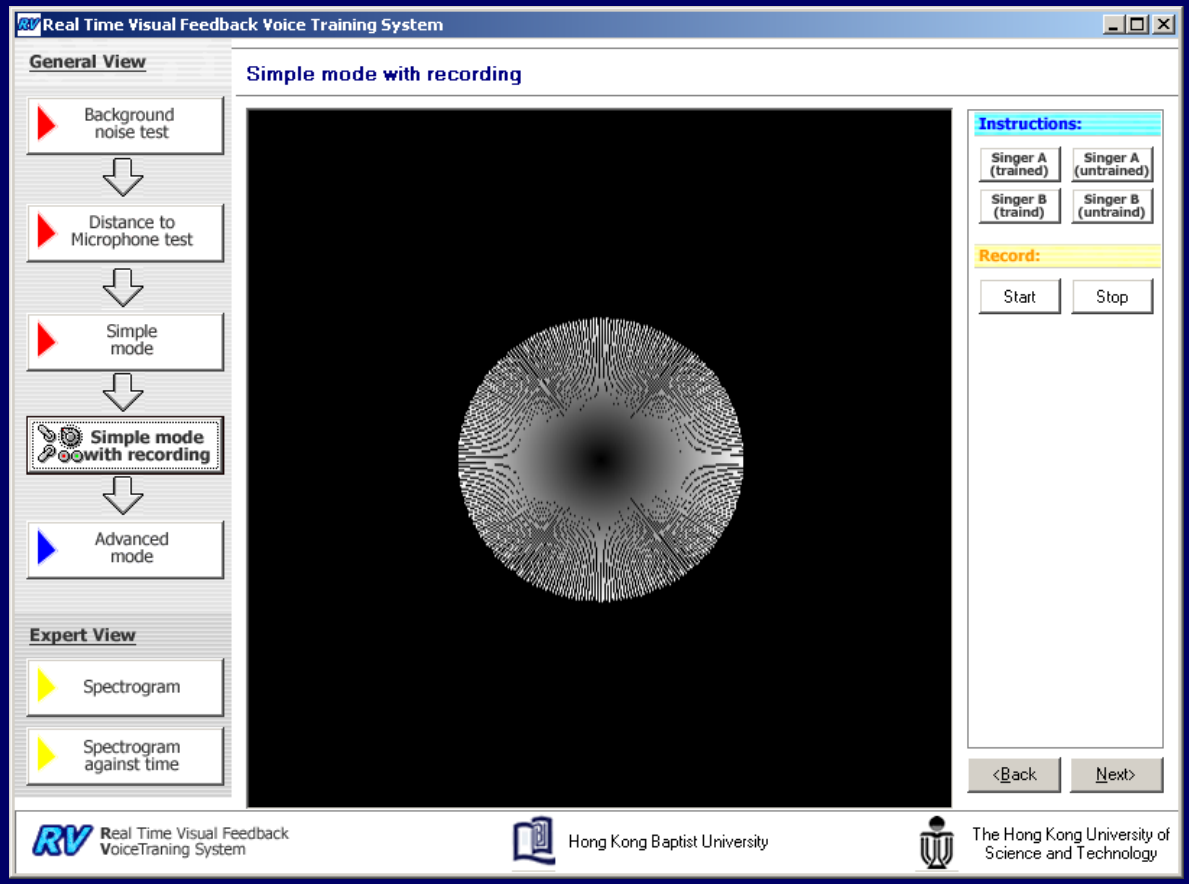
Simple mode with recording

- Play the samples
- Record your own voice



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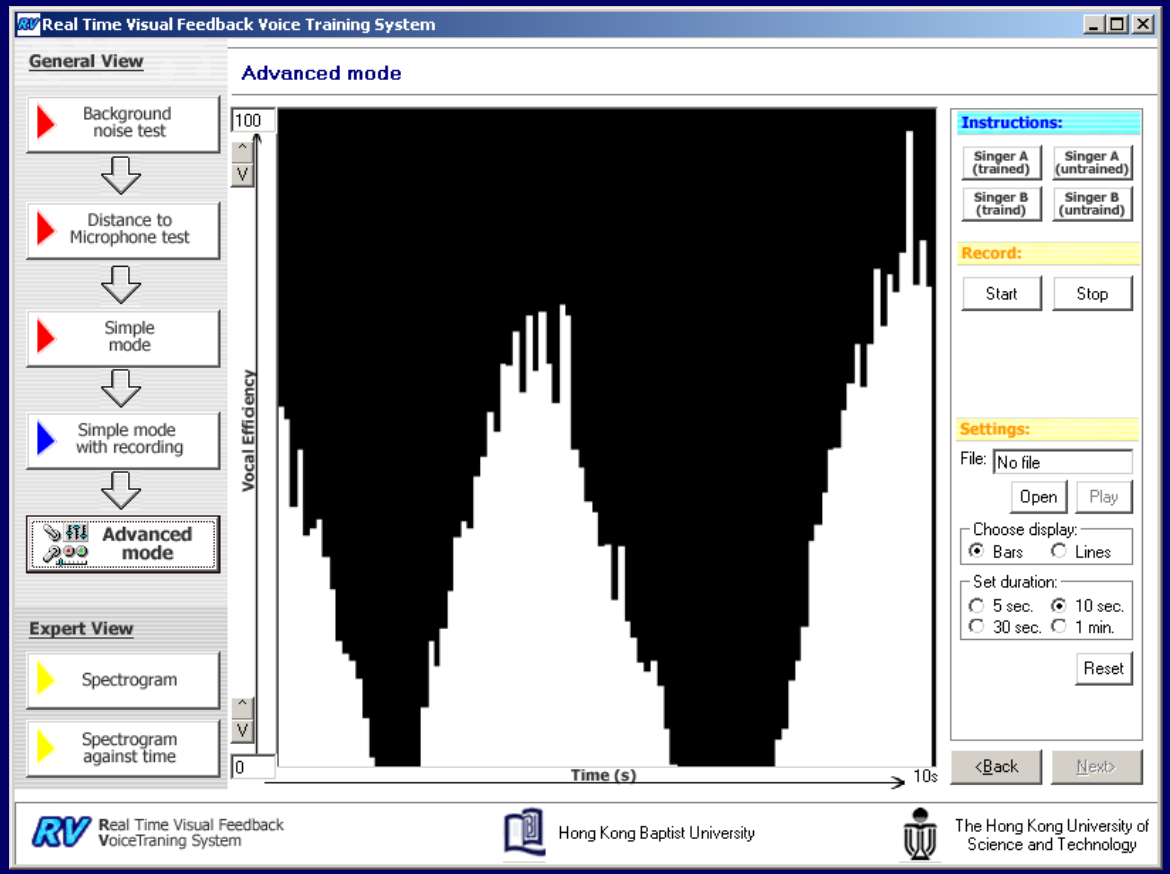
Advanced mode, 1

- Load sound files
- Update setting
  - Bar/line
  - Display duration
  - Axis scale
- Demo



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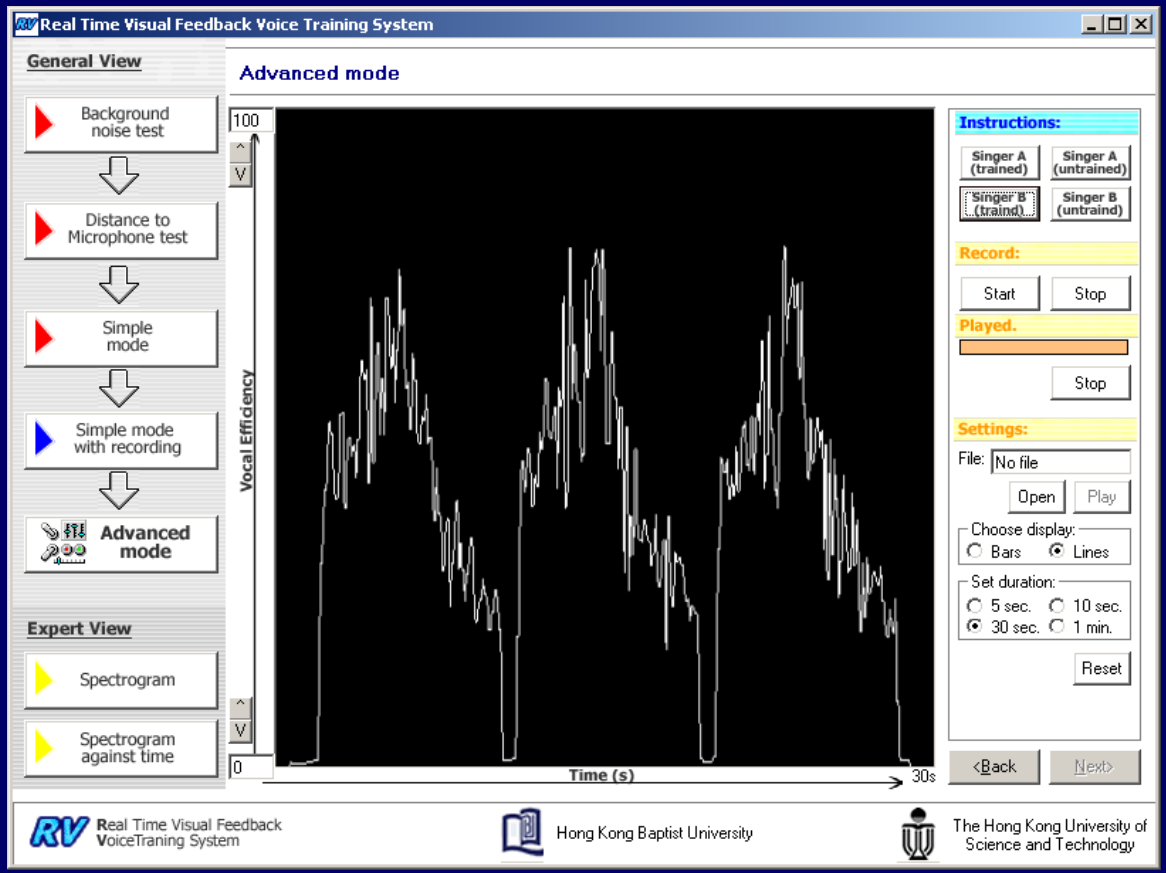
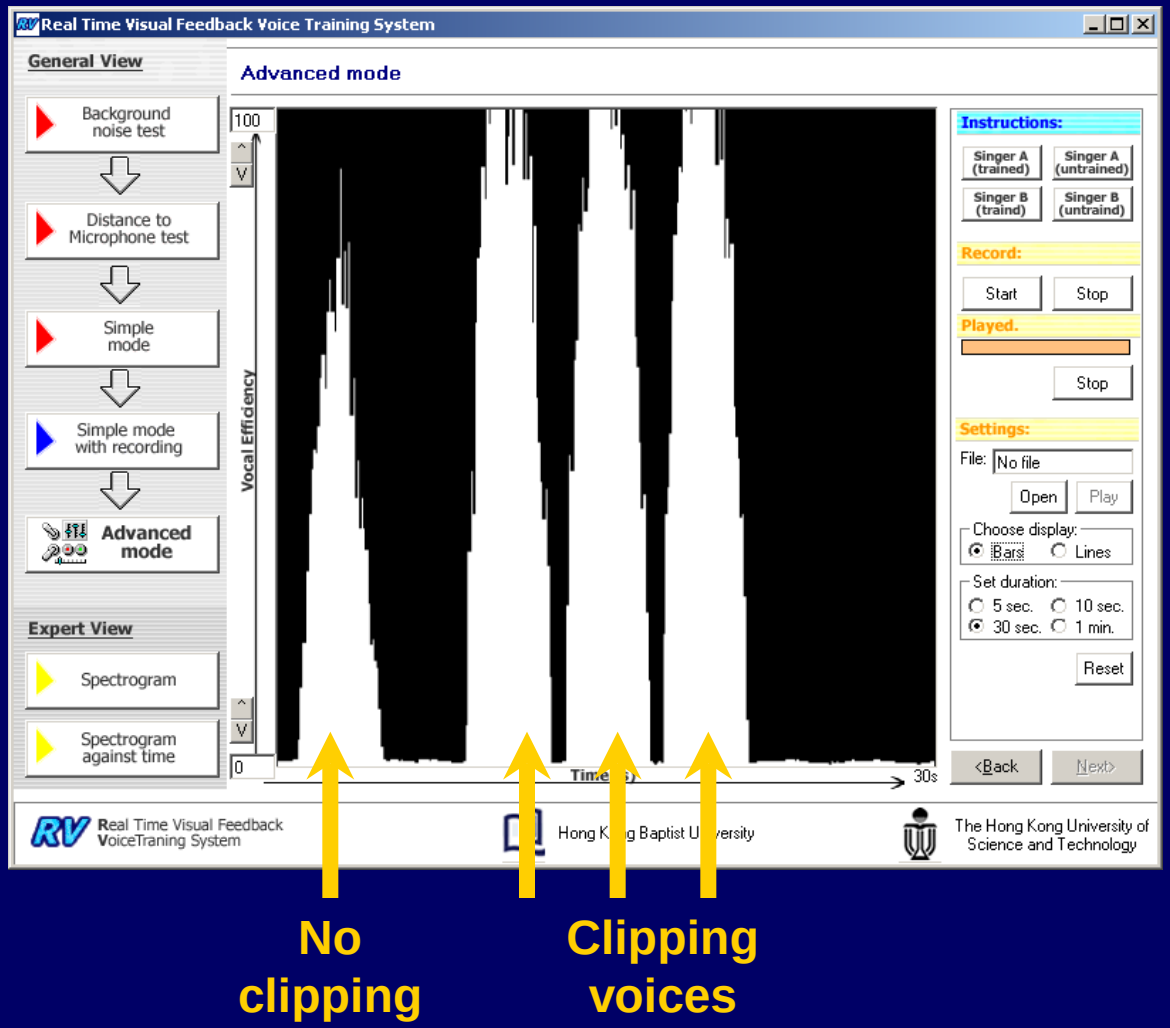
Advanced mode, 2

- In line display and 30s duration



Advanced mode, 3

- Too close distance, “clipping” occurs



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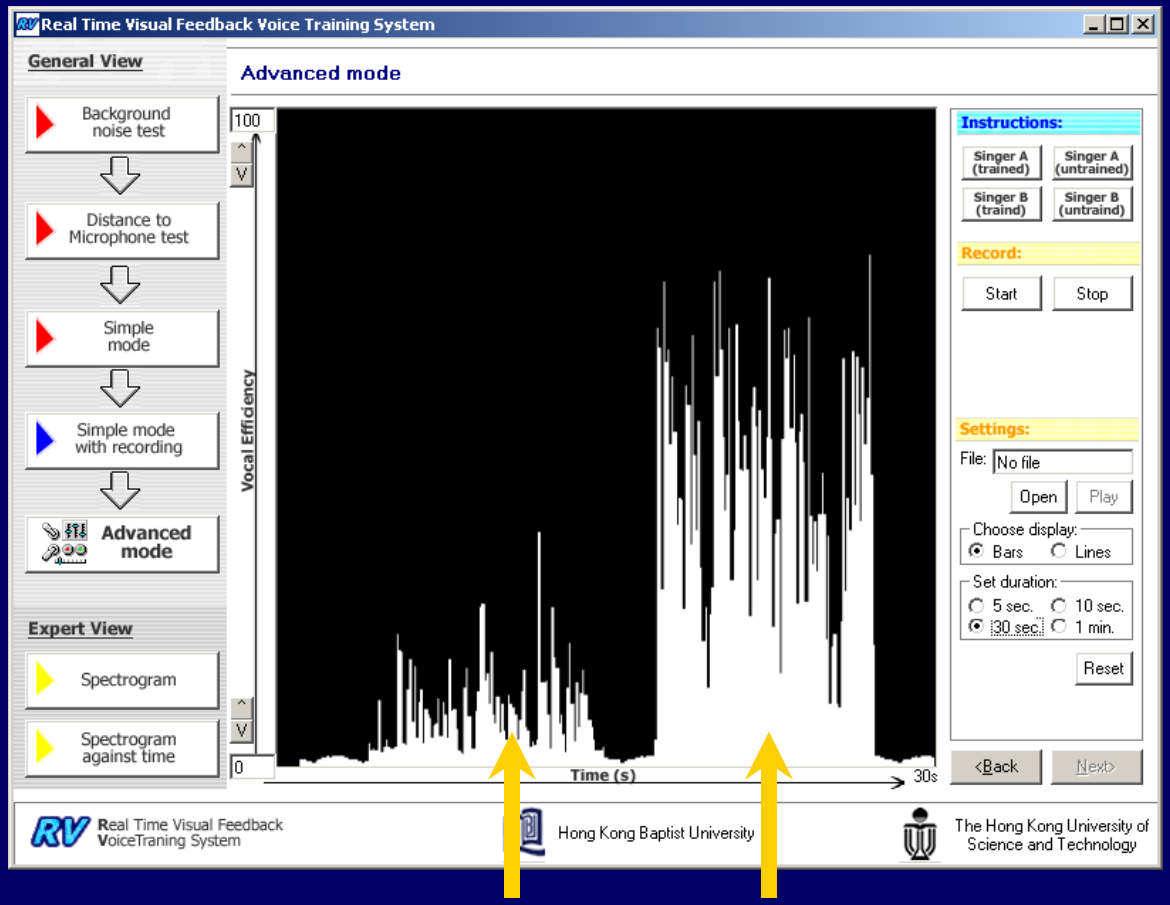
Advanced mode, 4

- Trained vs. untrained voice



Untrained voice

Trained voice

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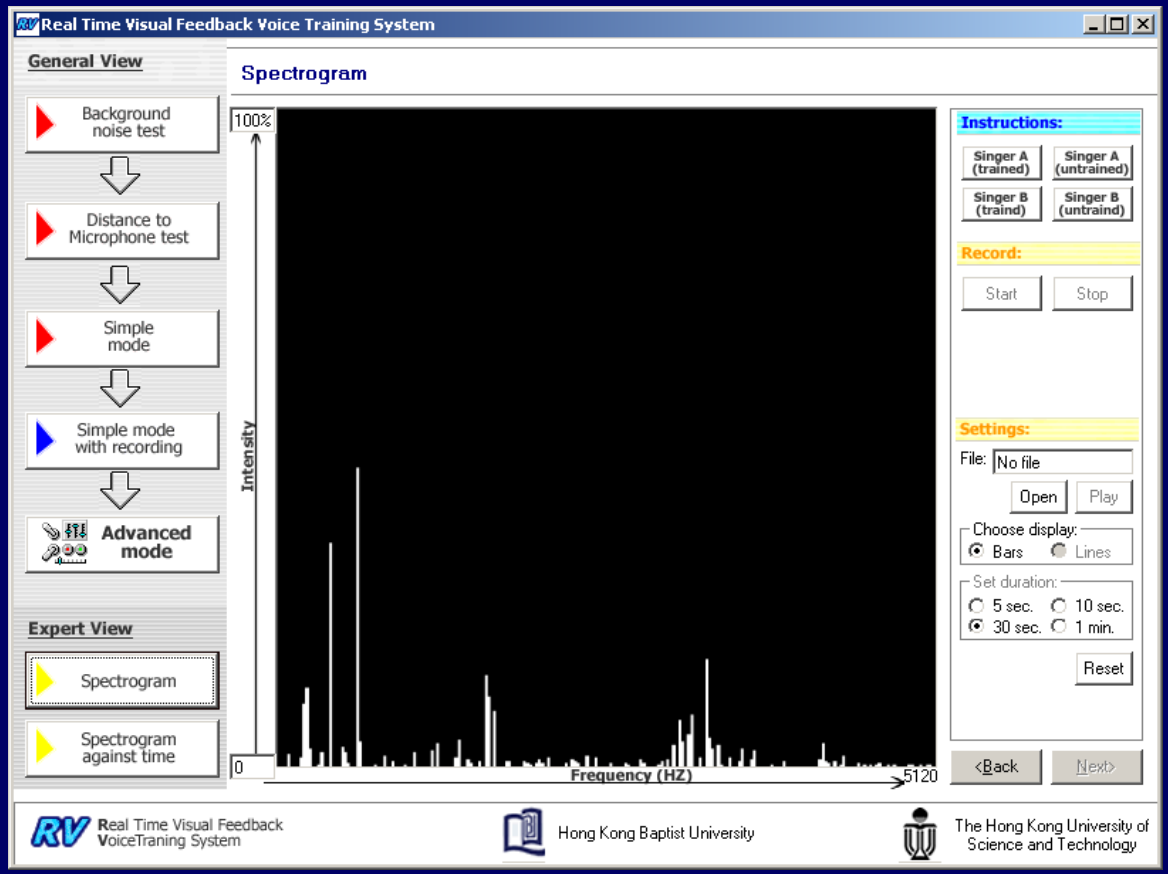
Expert view, 1

- Load sound files
- Update setting
  - Display duration
- Showing intensity of voice frequency



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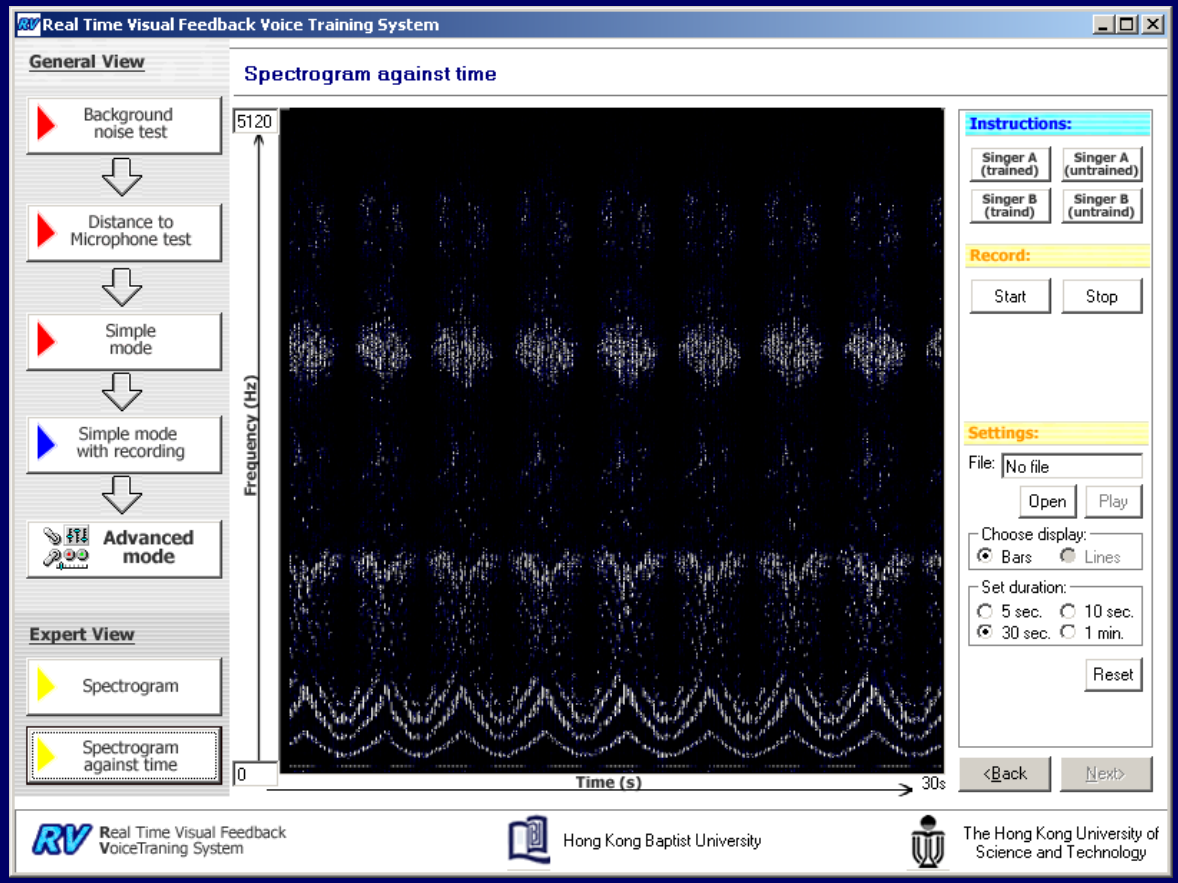
Expert view, 2

- Showing frequency vs. time



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RV – Tutorials

- Various references/exercises (to be included in RV)
  - References
    - Proper gesture
    - Correct mouth shape and air usage
    - Maintaining a health voice
  - Speaking exercises
    - E.g. From The John Henny Vocal Studio Inc.
    - let out a siren type of sound ("wooo" or "weee") and feel it go up into the head cavities.

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Conclusion

- RV facilitates teachers in voice training
  - Measures the singer's formant
  - Visualizes the sound as simple circles, lines
  - Supports recording for voice improvement
  - Allows various display setting for comparison
  - Provides expert users with spectrograms with detailed information
  - Provides useful tips in correct and healthy voice usage

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- Q&A
- Thank you