Li Creative Technologies, Inc.

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Lead Investigator: Qi (Peter) Li, PI, Ph.D. in EE, Speech and speaker recognition, feature extraction, fast discriminative training

Current research team members (LcT employees):

- Y. Yin, MS in CS, Research Engineer, Robust *ASR, Discriminative training*
- T. Ma, PhD in EE, Research Engineer*, Real time, large vocabulary decoder*
- U. Jain, MS in EE, Senior Research Engineer, *ASR, Nonnative speech recognition, pattern recognition*
- M. Zhu, PhD in EE, Senior Research Scientist, *Discriminative training, microphone array, noise reduction, echo cancellation*
- B. Tan, Ph.D. in EE, Senior Research Scientist, *Nonnative speech recognition, ASR, biometrics*
- J. Czop, MS in Speech, *Speech database research and labeler*
- D. Minerley, BS, *Speech database research and labeler*
- Y. Lai, Ph.D. in EE, Senior Research Engineer, *Acoustic/speech software, firmware, product, and system development (with DoD Clearance)*

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Research Area of Interests

Our company conducts extensive R&D in the following areas:

- Speech recognition and synthesis
- Real-time, spontaneous ASR system
- Speaker, dialect, and language recognitions
- Microphone array (linear, circular) and adaptive beam forming
- Noise reduction/cancellation and echo cancellation
- Acoustic and speech processing hardware/firmware
- Noncontact concealed intent and emotion detection
- Thermal image and video processing

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Summary of Qualification and Capabilities

- Automatic sub-word unit learning in speech recognition for language without pronunciation dictionary
  - For a language without decent pronunciation dictionary, sub-word units are automatically learned from speech and transcript as pronunciation units, and sub-word models (instead of traditional phone models) are built
- Large margin discriminative training for robust acoustic modeling, especially with limited training data
  - Large margin discriminative training significantly outperform traditional discriminative training algorithm such as MMI, given limited training data
- Fast discriminative training
  - Closed form adaption, fast training
- Auditory-based feature extraction for robust speech recognition
- Noise and channel compensation for robust acoustic modeling
  - Online learning of noise and channel model, noisy speech model is generated by integrating clean speech model, noise model, and channel model
- Streaming large vocabulary speech recognizer with instantaneous response for spontaneous speech
- Noise reduction and adaptive beam forming for recording
- Multi-language speech database collection, labeling, and cleaning

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Potential Collaboration

- We are willing to collaborate with any research group experienced in the research areas required by the solicitation.
- We have the experience in working with research institutes, universities, and companies.

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Contact Information

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