CBS Research Seminar

A Study on the Evolution of Vocal Tract from Chimpanzees to Humans

Presented by

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Date: 17 January 2018 (Wednesday)
Time: 2:00 p.m. – 3:00 p.m.
Venue: HJ302, The Hong Kong Polytechnic University

All are welcome.

ABSTRACT

As is well known, vowels [a, i, u] are regarded as the basic vowels in human speech. Chimpanzees, on the other hand, can only produce sounds reminiscent of [a] and [u] because of their small back cavity and the specific structure of their tongue muscles, which makes it impossible for them to form the vocal-track shapes as observed in humans. The differentiation of chimpanzees and modern humans dates back to 5 million years ago. Since tongue muscles and larynx cannot be fossilized, it is difficult to reconstruct vocal tracts simply based on the fossils of ancient homos.

Kong's team has established the physiological models of chimpanzees and modern humans based on 3D MRI data, which include the parameters of front cavity length, back cavity length, and similarity of vocal tract shapes. Through the vocal tract simulation from chimpanzees to modern humans, about fifty thousand 3D vocal tracts have been reconstructed, and sounds produced in the vocal tracts have been synthesized. By conducting speech sound perception tests, the team is exploring the time vowels could have emerged. Further research will deepen our understanding of the evolution of speech organs, as well as the origin of human language.