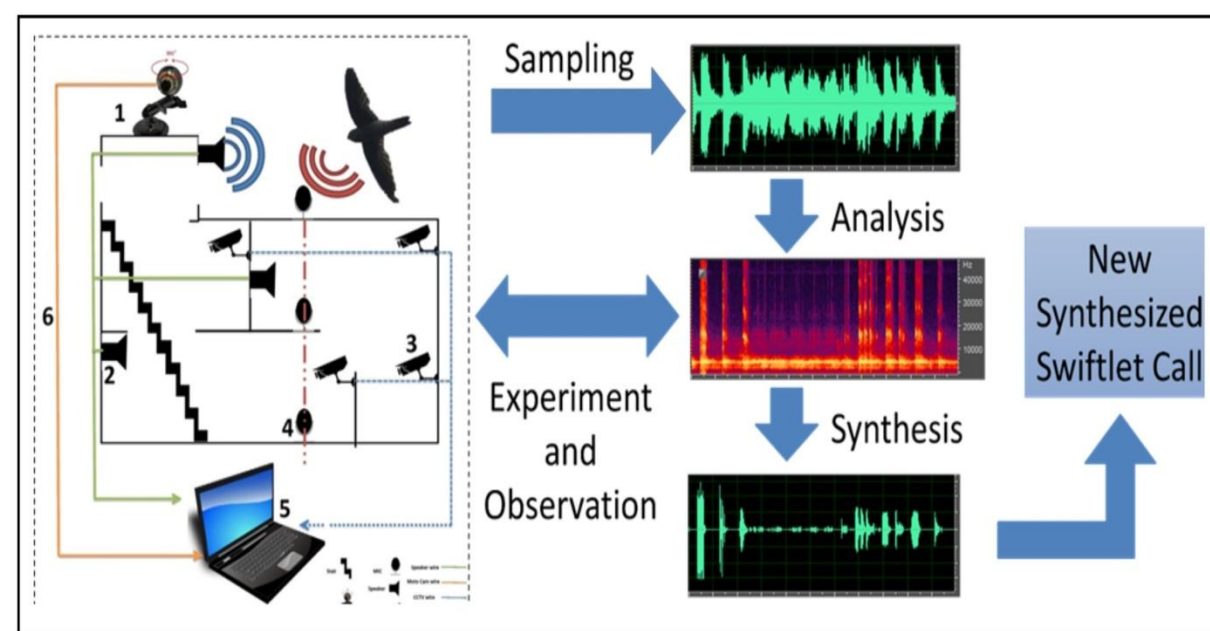


Bird Calls of Different Frequencies on Free-flying Edible Nest Swiftlet (*Aerodramus fuciphagus*) at Universiti Putra Malaysia



Newly synthesized swiftlet calls are developed.

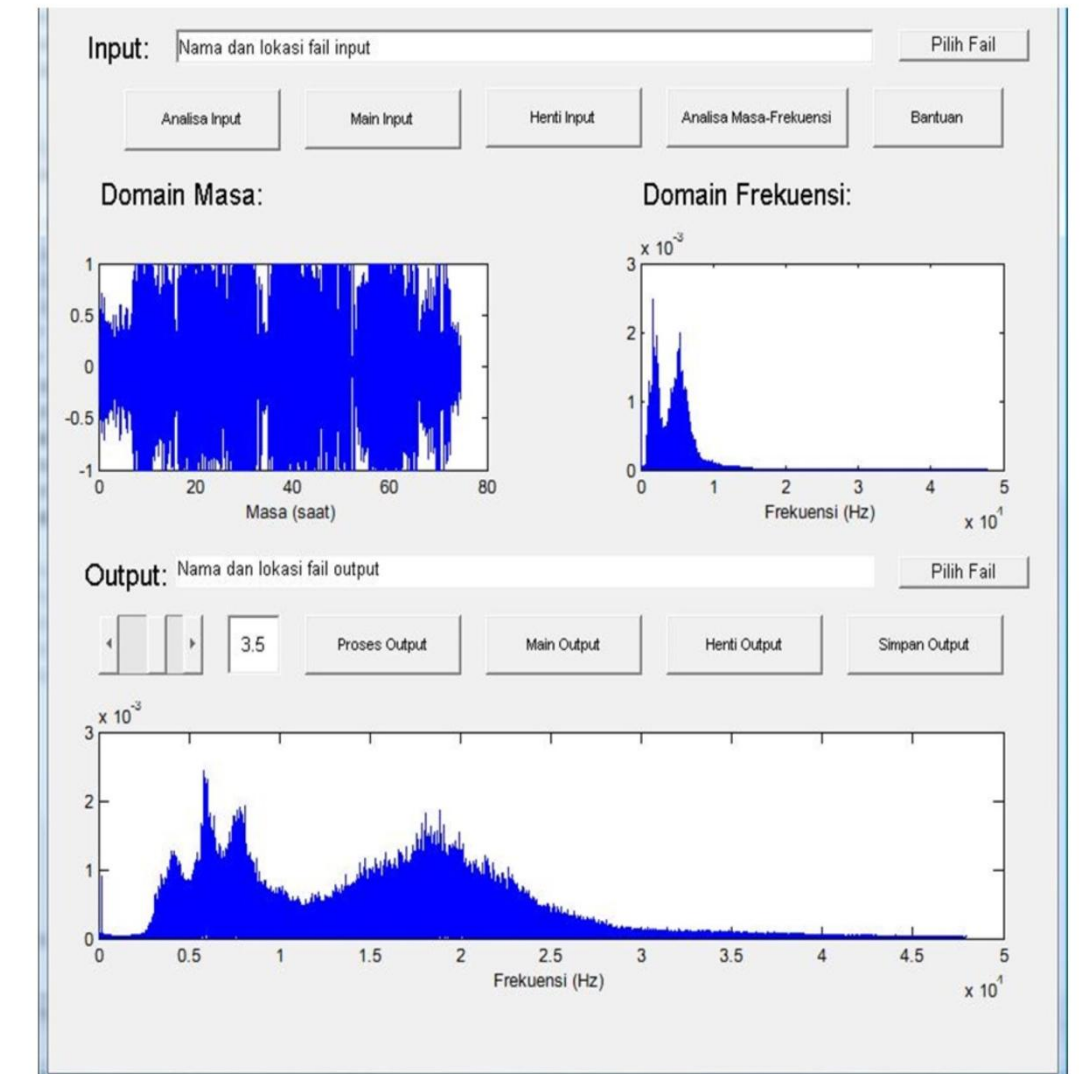
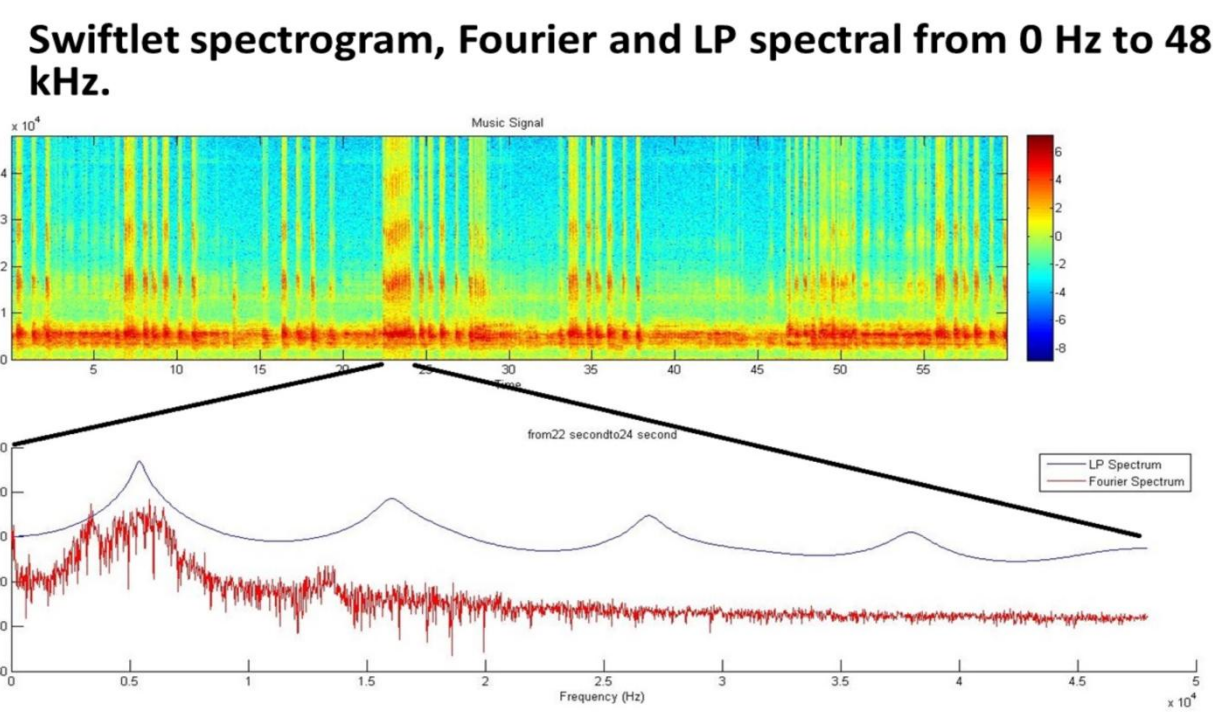


Figure 3: The pattern of birds stimulated to the bird calls within two hours before sunset.

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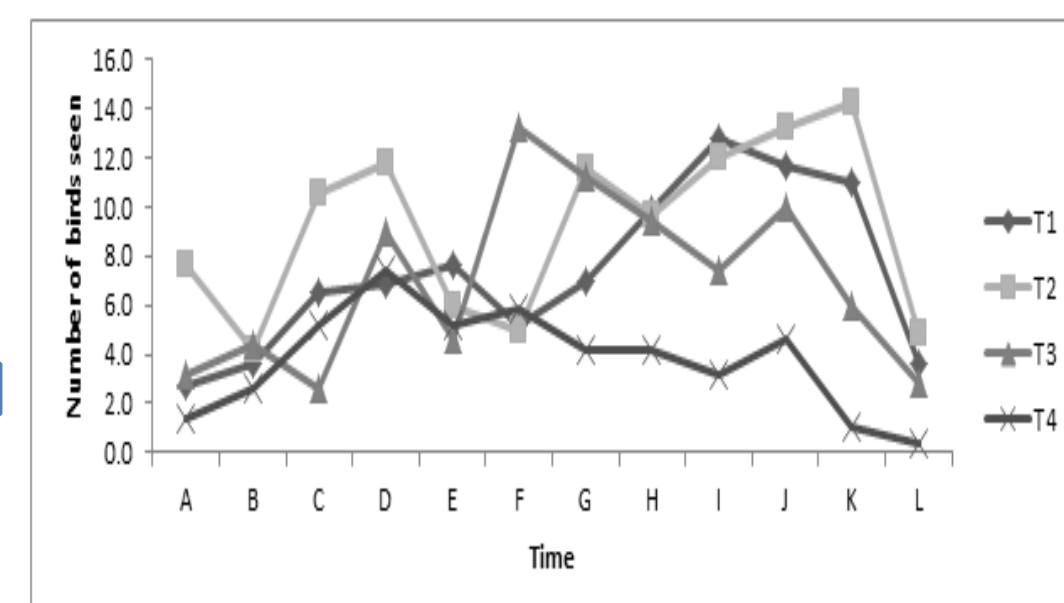


Table 2: The time schedule for the observation

Time interval	Actual time (as reaching sunset)	Time interval	Actual time (as reaching sunset)
A	120 minutes	G	60 minutes
B	110 minutes	H	50 minutes
C	100 minutes	I	40 minutes
D	90 minutes	J	30 minutes
E	80 minutes	K	20 minutes
F	70 minutes	L	10 minutes

Table 1: The frequency of the bird calls

Bird call	Frequency (Hz)
T1 (unshifted)	2,500
T2 (modified 1)	5,000
T3 (modified 2)	10,000
T4 (modified 3)	15,000

Introduction

Sound is categorized into three main parts which is infrasound, audible sound and ultrasound. The range of sound that can be heard by human's ears is audible sound, the frequency ranging approximately between 20 Hz to 20,000 Hz (Heffner and Heffner, 2007). Some animals are able to hear inaudible sounds. In birds, the echo click of the oilbird and swiftlet are single or double clicks with frequencies between approximately 500 to 15,000 Hz and between 1,000 to 10,000 Hz, respectively (Thomassen et al., 2007). The echolocation is used to navigate acoustically in the darkness for their roosting and nesting site in caves. The consequence of rearing edible nest swiftlets within the vicinity of human dwellings in urban areas is noise pollution emitted by playing the bird call soundtrack from the bird house. Thus, this research was conducted to test and monitor the reaction of the swiftlets towards the different frequencies of echolocation calls at the newly bird house at Farm 10, UPM.

Methodology

The study was conducted at the new experimental man-made bird house within the vicinity of human dwellings at Farm 10, UPM. The experimental subjects used were the free-flying edible nest swiftlets (*Aerodramus fuciphagus*). The birds were observed during the evening, which is specifically two hours before the sunset. The bird pulling calls were played by using the portable hexagonal speaker with the intensity of 60 decibels (dB) hearing range.

Results & Discussion

- The higher the frequency was shifted, the bird call tends to lose the bird sound characteristics.
- The temperature began to drop as it reached dusk and inversely, the number of birds starts to rise and many are seen fly around the bird house.
- Another reason of the decrease in temperature is the presence and speed of the wind.
- The windier the environment, the more birds are flying and gliding in the sky.
- They are gliding more and flapping less in the higher altitude, which gliding is associated in saving and optimizing the energy during flight.

- Weimerskirch et al. (2001) argued that by beating their wings less frequently and glide for longer periods in flight time thus reduce the consuming of the power input.
- The tiny flying insects are being carried by the wind to the considerable certain level of height, which has been reported by Service (1980).

Conclusion

The proper pitch and frequency of bird calls are welcoming more birds into the swiftlet house. This study proves that the recommendable intensity and frequency of sound are 60 dB and below 15 kHz, respectively. The observation is conducted during the evening because abundance of birds is seen in the air rather than other part of the day. More birds are seen as it is reaching dusk as the temperature declines.

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