کارگاه های آموزشی مرکز اطلاعات علمی جهاد دانشگاهی

کارگاه آنلاین مکالمه روزمره انگلیسی

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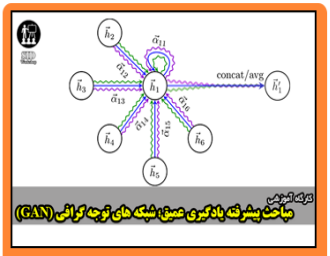

مباحث پیشرفته یادگیری عمیق؛
شبکه های توجه گرافی
(Graph Attention Networks)

SOME ASPECTS OF EROSIVE WAVES AT KUNDUCHI BEACH, DAR ES SALAAM, TANZANIA

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Extended Abstract

The coastline of Tanzania is experiencing serious erosion in most parts and accretion in some parts. The causes of erosion are generally of two types: those caused by nature, especially climate change, and those caused by human activities. The last decade has seen more and more investments such as hotels and residential properties, encroaching onto coastal areas that are susceptible to erosion.

Because of the high-valued investments in the coastal area, it is necessary to undertake a study on the erosive forces and put forward options for their protection and sustainable management. This study is one in a series of studies on coastal erosion in Tanzania. Its objective is to augment the available scanty information on coastal erosion.

The study area is Kunduchi Beach, which is located 10 km north of Dar es Salaam City. A casual look at Kunduchi Beach would convince someone to believe that the fringing reef and the offshore islands of Mbudya, Pangavini and Bongoyo protect the beach. However, the bathymetry off the beach shows that there are two submerged channels between the beach and the islands, which runs parallel to the coastline. Given the presence of these channels and the high tidal range (> 4 m), it is likely that offshore waves will reach the beach and break right on the beach slope.

An observation of the waves was carried out by deploying wave gauges on the tidal flat at about 100 m from the beach. According to the measurements, the highest tide level is +2.5 m in the period of September. During low tide, the tidal flat is dry. Significant wave heights and period vary in phase with the tide level.

Results show:

- During flooding and ebbing tide, the probability density function of the surface elevation are more peaked and less extended than during high water.
- Figures of wave spectra recorded during the month of April, when the monsoon winds are north-easterly, show that there are mainly two groups of waves reaching the eroding beach. The main group has a spectral peak at frequency fps = 0.0837 Hz and the secondary group is found at the frequency twice the main spectral peak at fpw = 0.1674 Hz. The figures show also that during the north-easterly winds, the spectra exhibit almost the same shape in a day. Waves reaching the beach can be divided into two main groups; the first group is swells (0.04< frequency < 0.1) and the second group is wind waves (frequency > 0.1).
- Figures of typical wave spectra measured during September, when the winds are south-easterly show that here is practically no energy in the higher and lower parts of the spectrum. During the south-easterly winds, wave spectra are generally multi-peaked and broad-banded. At high water, waves can be divided into three groups; long waves with

frequency less 0.04, swells with frequencies between 0.04 and 0.1; and wind waves with frequencies greater than 0.1 Hz. Most of the energy is concentrated in swells and wind waves. Wave spectra during flooding and ebb tide are low and spread across all frequencies.

The energy-based significant wave height (*Hmo*) and peak period (*Tp*) vary in phase with the mean water level at the tidal flat off Kunduchi Beach during September. It is shown also that *Hmo* and *Tp* are linearly related to water level. Also, *Hmo* is linearly related to peak period. During high water, the wave height distribution has a tendency to skew toward the high wave side of the Beta-Rayleigh distribution. Other statistically base wave height parameters such as the root-mean square wave height (*Hrms*), expected values of the mean heights of the highest one-tenth ($H_{1/10}$) and one-hundredth ($H_{1/100}$) are shown in Table 1.

Table 1. Some statistical parameters of waves near Kunduchi beach

Mean water depth (m)	Std of surface elevation (m)	Tp (s)	Hmo (m)	Hrms (m)	H(1/3) (m)	H(1/10) (m)	H(1/100) (m)
1.40	0.0867	5.82	0.24	0.18	0.26	0.34	0.54
1.68	0.1153	7.53	0.32	0.25	0.36	0.50	0.69
1.92	0.1375	10.67	0.37	0.31	0.46	0.52	0.61
2.07	0.1411	9.48	0.41	0.33	0.47	0.54	0.69
2.16	0.1383	9.1	0.39	0.31	0.46	0.63	0.73
2.16	0.1303	10.7	0.36	0.30	0.42	0.49	0.61
2.11	0.1334	10.24	0.38	0.31	0.43	0.54	0.82
1.98	0.1109	11.13	0.31	0.27	0.39	0.44	0.75
1.78	0.0954	9.14	0.27	0.22	0.34	0.38	0.60

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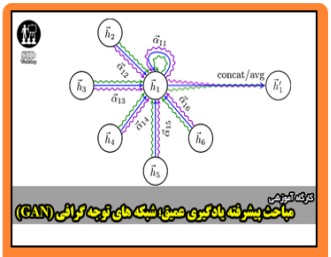

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