of the connection is presented in Figure 1, and the models are formulated in system (4.11). We will show that the chaos that appears in A_1 spreads to all the other models. A_2 serves as a replicator of the chaos of A_1 and as a generator of chaos in A_3 and A_4. Model A_4 is a replicator of the chaos of A_2 and a generator of chaos in A_5.

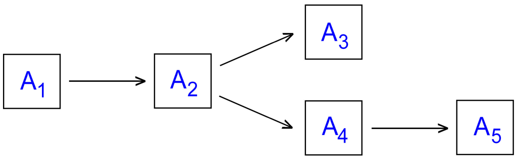

Figure 1: The connection topology of the systems $A_1 - A_5$.

The following is a system of five unidirectionally coupled models $A_1 - A_5$.

$$
\begin{aligned}
&\left.\kappa_{j+1} = \mu\kappa_j(1-\kappa_j),\right\} A_1\\
&\left.\begin{aligned}
y_1' &= (1/8)y_1 - (5/16)k_1 - a_1y_1^3 - \frac{3\sqrt{a_1}}{2}y_1^2 + \nu_1(t,\theta),\\
k_1' &= (1/4)y_1 - (3/8)k_1 - a_1y_1^3 - \frac{3\sqrt{a_1}}{2}y_1^2,
\end{aligned}\right\} A_2\\
&\left.\begin{aligned}
y_2' &= (1/3)y_2 - k_2 - a_2y_2^3 - \frac{\sqrt{6a_2}}{2}y_2^2 + 0.6y_1(t) + \nu_2(t,\zeta),\\
k_2' &= (1/2)y_2 - (5/4)k_2 - a_2y_2^3 - \frac{\sqrt{6a_2}}{2}y_2^2,
\end{aligned}\right\} A_3\\
&\left.\begin{aligned}
S' &= 0.23Y + 0.1S(1-Y^2),\\
Y' &= 0.5(S+F) + 2(y_1(t)+0.5),\\
F' &= 0.19S - 0.25Y,
\end{aligned}\right\} A_4\\
&\left.\begin{aligned}
y_3' &= (3/5)y_3 - (4/5)k_3 - a_3y_3^3 - \frac{3\sqrt{a_3}}{\sqrt{10}}y_3^2 + 0.01Y(t),\\
k_3' &= (7/10)y_3 - (9/10)k_3 - a_3y_3^3 - \frac{3\sqrt{a_3}}{\sqrt{10}}y_3^2,
\end{aligned}\right\} A_5
\end{aligned}
\tag{4.11}
$$

where a_1, a_2, a_3 are constants and the piecewise constant functions $\nu_1(t,\theta)$ and $\nu_2(t,\zeta)$ are defined as follows:

$$
\nu_1(t,\theta) = \begin{cases} 0.019, & \text{if} \quad \theta_{2j} < t \le \theta_{2j+1},\\ 0.002, & \text{if} \quad \theta_{2j-1} < t \le \theta_{2j}, \end{cases} \tag{4.12}
$$

and

$$
\nu_2(t,\zeta) = \begin{cases} 0.0006, & \text{if} \quad \zeta_{2j} < t \le \zeta_{2j+1},\\ 0.0017, & \text{if} \quad \zeta_{2j-1} < t \le \zeta_{2j}, \end{cases} . \tag{4.13}
$$

The sequence $\theta = \{\theta_j\}$, $j \in \mathbb{Z}$, of the discontinuity instants of the function (4.12) satisfies the relation $\theta_j = j + \kappa_j$, where the sequence $\{\kappa_j\}$ is a solution of the logistic map A_1 with $\kappa_0 \in [0,1]$. The sequence $\zeta = \{\zeta_j\}$, $j \in \mathbb{Z}$, of the discontinuity instants of (4.13) satisfies the relation $\zeta_j = 2\sqrt{2}j$ for each j.