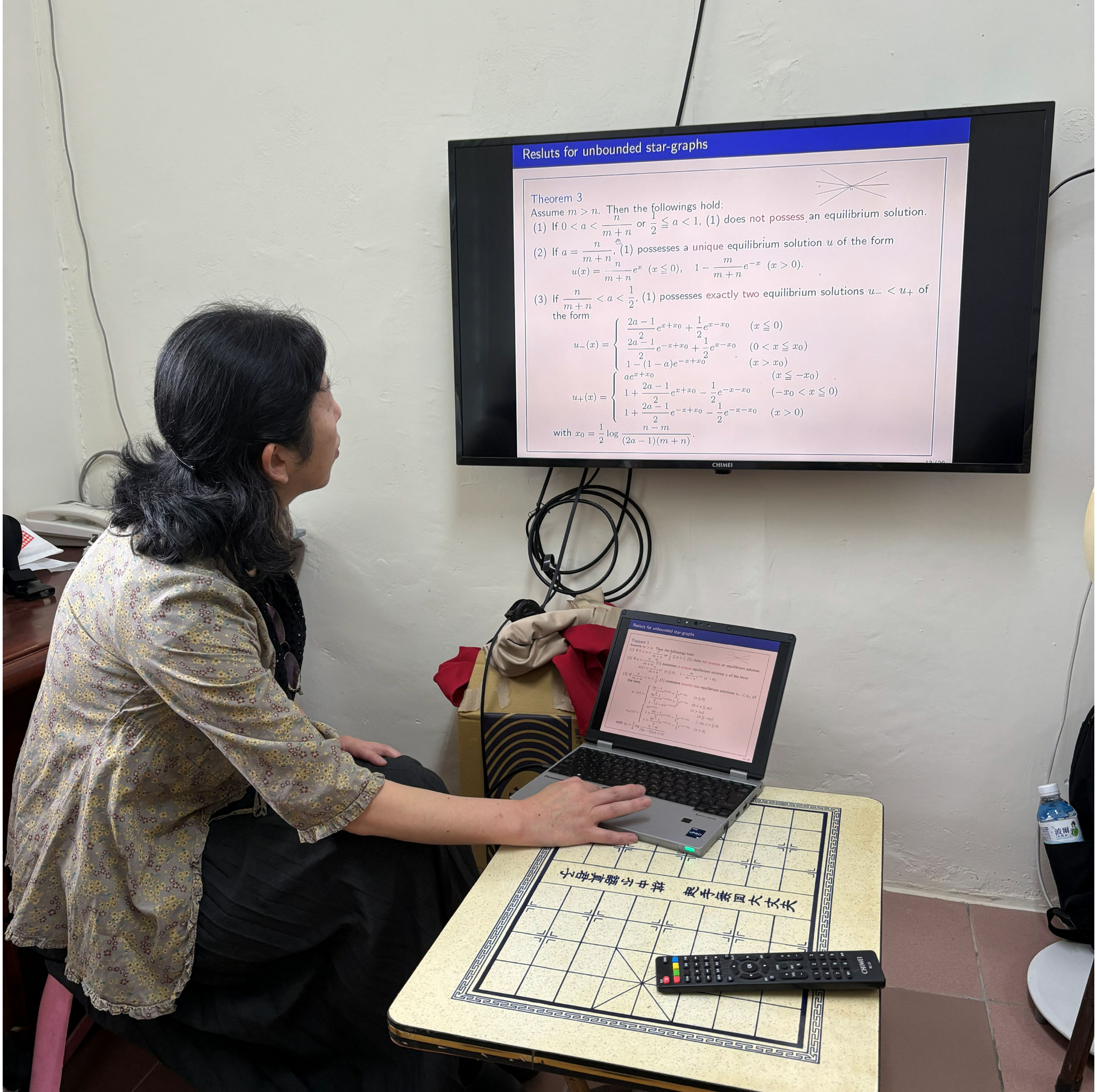
Resluts for unbounded star-graphs
Theorem 3
Assume $m > n$. Then the followings hold:
(1) If $0 < a < \frac{n}{m+n}$ or $\frac{1}{2} \leqq a < 1$, (1) does not possess an equilibrium solution.
(2) If $a = \frac{n}{m+n}$, (1) possesses a unique equilibrium solution u of the form
$u(x) = \frac{n}{m+n}e^{x} \quad (x \leqq 0), \qquad 1 - \frac{m}{m+n}e^{-x} \quad (x > 0).$
(3) If $\frac{n}{m+n} < a < \frac{1}{2}$, (1) possesses exactly two equilibrium solutions $u_- < u_+$ of the form
$u_-(x) = \begin{cases} \frac{2a-1}{2}e^{x+x_0} + \frac{1}{2}e^{x-x_0} & (x \leqq 0) \\ \frac{2a-1}{2}e^{-x+x_0} + \frac{1}{2}e^{x-x_0} & (0 < x \leqq x_0) \\ 1-(1-a)e^{-x+x_0} & (x > x_0) \end{cases}$
$u_+(x) = \begin{cases} ae^{x+x_0} & (x \leqq -x_0) \\ 1 + \frac{2a-1}{2}e^{x+x_0} - \frac{1}{2}e^{-x-x_0} & (-x_0 < x \leqq 0) \\ 1 + \frac{2a-1}{2}e^{-x+x_0} - \frac{1}{2}e^{-x-x_0} & (x > 0) \end{cases}$
with $x_0 = \frac{1}{2}\log\frac{n-m}{(2a-1)(m+n)}$.
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