Hi Professor Fliflet,

I went back through the literature and found that most cribs are designed for babies before age two. Federal crib regulations have set the minimum distance between the top of the mattress support and the top of the crib side rail as 26 in., and this height must include a 6-inch thick mattress. So when a mattress is used with the crib, the height of the crib side as a barrier is 20. By age two, a typical body length has reached 33.5 inches (85 cm). According to the data online: https://www.medicalnewstoday.com/articles/324728#average-lengths, even if is a 7-month-old baby, the average body length reaches 27 inches (69 cm). This means that even if you don't have a mattress, the crib fence is lower than the baby's standing height, so people can't rule out the risk of the baby climbing out of the fence.

Secondly, to answer the first question, since babies are generally more likely to cry and wake up hungry at night, it is more difficult to obtain accurate information with cameras at night. Night vision devices are more expensive, which will increase the cost significantly. At the same time, we do not need clear image information, but whether there is a baby over the fence behavior detection. Therefore, compared with the need for high-precision image recognition and simple ultrasonic detection, I think the latter is more convenient and low-cost. The possibility of error is also less than the former, which means less ineffective bother for parents.

Regarding whether ultrasound will affect the baby, we can use low-frequency ultrasound (0.1-15 MHz), which is called non-destructive testing (NDT). In our daily lives, we also use this technology in hospital ultrasounds, most of which are medical ultrasounds for pregnant women and babies. Therefore, I believe that as long as we control the ultrasonic transmission pattern well, such as low-frequency pulse emission every five seconds, it is enough to meet the daily monitoring needs and will not expose babies to the risk of ultrasonic irradiation for a long time.