DryNights - A self-powered bedwetting alarm

Bedwetting (Nocturnal Enuresis) affects about 12% of all 5-10-year-olds, which equals more than 80 million children world-wide. Bedwetting alarms are seen as the most effective solution for nocturnal enuresis and have a success rate of 75-90%. However, most bedwetting alarms are bulky, use Bluetooth, consume lots of batteries and require special underwear, so they're not very child-friendly.

During this research, which was executed at Lifesense Group B.V. (Eindhoven) under the supervision of Prof. Dr. Ir. Panos Markopoulos (TU/e) and Dr. Valer Pop (CEO, Lifesense Group B.V.) a new, innovative bedwetting alarm has been developed, called ‘DryNights’.

DryNights is a small, comfortable and self-powered bedwetting alarm for kids suffering from nighttime bedwetting. The unique DryNights sensors require no batteries as the sensors are powered by the urine itself using the principle of an electrochemical cell.

The small adhesive sensor can be easily attached to any underwear or pajama pants. During the night, when the child becomes wet, the sensor will send a (harmless) audio-based signal to the mobile device running the DryNights application. The app will then awaken the child and guide him or her to the toilet. Within 6-12 weeks, the DryNights routine will condition the child to wake up on their own and visit the toilet before wetting the bed.

**Figure 1:** The DryNights app helps to motivate the child by gamification and a rewarding system.

**Figure 2:** The self-powered DryNights sensors use the principle of an electrochemical cell (copper + magnesium + salt bridge (urine)) to generate its own power.

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