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Monitoring scoliosis progression

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Monitoring Scoliosis Progression: Optimizing Positioning and Ultrasound Imaging

Dyah Ekashanti Octorina Dewi

– Cover story –

**'Dewi Srikandi in Javanese puppet performing Scoliosis measurement
by means of the *BalancAid* and 3D ultrasound imaging of the spine'**

*In Javanese wayang tradition, Dewi Srikandi is called the warrior-princess.
She is known not only for her beauty and elegance, but also for her brave characters
that appointed her as Bharatayuda's warlord in the Mahabharata epic.*

*Her strong interests in martial arts and archery brought her to keep sharpening
her proficiency and versatility in using weapon arrow to Arjuna.*

*Dewi Srikandi is an inspiration for Indonesian woman who never gives up to reach her future,
to strive for honour, and to play role in establishing a beautiful, respectful, and peaceful world,
no matter how hard the obstacles are.*

Dewi Srikandi in this cover represents a young scoliotic girl who struggles to have a normal spine.

*Her persistence, patience, and spirit to fight against her limitation
have shown that she is special ... as special as Dewi Srikandi...*

**'Monitoring Scoliosis Progression:
Optimizing Positioning and Ultrasound Imaging'**

D.E.O. Dewi

PhD Thesis - Department of BioMedical Engineering
University Medical Center Groningen, University of Groningen
Groningen, The Netherlands

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Preface

The story of a dark shadow ...

The ultrasound principle in generating image reminds me of a spectacular show that my parents presented during my childhood. Being born and raised in a traditional Javanese culture allows me to experience a classical story telling before bed time that my parents directed and also starred almost every night.

When the '*Kancil nyolong timun*' (a deer steals cucumber) show was started, my bed theater was made dark, only a light from the flashlight that my mother directed to the wall was on. Then, my father's fingers were suddenly transformed into funny characters he played on. He moved his fingers in such a way that the shadow on the wall is reflecting the shapes of the characters; *si Kancil* (the deer), *pak Tani* (the farmer), and *anjing gembala* (sheepdog). Sometimes my mother had to move the flashlight up and down following the movement of my father's hands while acting an active character of *si Kancil*.

Even the show was only presented in dark and light, it has brought an essential understanding about the light signal that passes through the objects. The incapability of the light to cross solid objects resulted in dark shadow on the wall without leaving any visible transparent structures. However, transparent objects are still capable of transmitting the light, but with decreased intensity, resulting in imaginative silhouette.

(A piece of uncountable beautiful memories with my beloved parents)

*I dedicate this thesis to the memory of remarkable parents
Sidiq Nizami and Sutarti*

Habis gelap terbitlah terang

Door duisternis tot licht

From darkness to light

... Raden Adjenng Kartini ...

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