

Preface

The world we are living in is now expanding quickly. Our world yesterday was closed but now it is wide open. In a closed world, we could make predictions. Designers could foresee how people would behave so they could define missions and could design machines and products. But today situations change very extensively and very frequently. If the world is closed and does not change appreciably, we could make decisions rationally or in other words based on logics of induction and deduction. But it becomes more and more difficult to make decisions and act rationally. All we know are a starting point and a goal, nothing more. If the boundary is clear, then we could apply such a method as reinforced learning which is often applied to navigate a robot in an unstructured environment. But in an open world, boundaries disappear so we have no other ways than to make decisions and take actions by trials and errors.

In a closed world, we could find an optimum but in an open world we cannot even define a global optimum. Thus, we have to come back to the basics of engineering. What is engineering for? Engineering is here to make our dreams come true or to satisfy our expectations. Thus, in an open world, we have to consider how we can satisfy our customers' expectations instead of searching for an engineering optimum. So design is changing quickly to a satisfying design or how we can develop a product which our customers feel good enough. This means performances are more important than functions. We have to get away from our traditional function-based design and move toward satisfaction-focused design. To achieve this goal, we have to know how our customers emotionally reacts to our products and further in order to design a new product, we have to know how they make decisions emotionally.

Yesterday's design was one way from the producer to the customer. It is very much linear. But today's design has to be very reflective. We have to know the feedbacks from our customers. We have to communicate more and more to understand their emotions in order to develop a new product.

Chapters in this volume describe many different aspects of such changes in design and how emotion plays an important role there. This volume contains many sensing issues of emotion, which are crucial in emotional design. Engineering yesterday focused more on machines and we made our efforts to increase their capabilities. It is actuation-focused. But if you read these chapters, you will find out

how engineering is changing from actuation-based to sensing-based. Sensing plays a very important role in today's engineering. Yesterday, sensing was carried out to gather information and signals were well defined. But today we do not know what we should sense and how we can sense it; although sensing is very important to understand our customers' emotions, how we can detect emotions is still an open issue today. It is a much complex issue and we have to find our ways how we can sense emotions better. These chapters will provide a good perspective in which direction we should move forward.

I hope this book will help engineers navigate through uncharted waters of tomorrow and surf the big tides of change.

Finally, I would like to thank all the authors from the bottom of my heart for contributing chapters out of their busy schedule and would also like to thank Mr. Anthony Doyle and Ms. Grace Quinn, both at Springer, UK.

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<http://www.springer.com/978-1-4471-4983-5>

Emotional Engineering vol. 2

Fukuda, S. (Ed.)

2013, VIII, 242 p., Hardcover

ISBN: 978-1-4471-4983-5