Creative Solutions for Footwear Design and Pattern Engineering: 2D and 3D Perspectives

A manual for Creative Design and Pattern Engineering

CSIR-Central Leather Research Institute
in association with
Council for Leather Exports
supported by Indian Shoe Federation
Indian Finshed Leather Manufacturers & Exporters Association
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FOREWORD

The use of digital technologies in the footwear and leather goods industries is now an essential element of brand development enabling firms to achieve an impressive increase in margins. Emerging Technologies like Virtual Prototyping brings huge cost reductions and allows collections to be approved two to three times faster. If you want to boost your productivity and get the best return on investment available on the market, you need a CAD/PDM system as a precise tool to meet the exacting quality demands.

Training staff and students is of crucial importance, a fact recognised by CSIR-Central Leather Research Institute, which has been offering exclusive Training programmes to transform ‘practicing designers’ into ‘thinking designers’ through an exposure to various facets and influences that contribute to the evolution of a shoe design and to provide participants with hands on experience of Design and CAD Pattern Engineering.

To aid the trainees master the use of the latest Computer Aided Design systems, the Shoe and Product Design Centre (SPDC), CSIR-CLRI, had compiled a “Manual for 2D CAD Pattern Engineering” in September 2007.

With the advent of more sophisticated technologies, it was felt that a new and improved version of the CAD Manual be brought out which would help in understanding the intricacies and new technologies relating to 3D conceptual design, 3D last modeling, and sole design.

This manual titled “Creative Solutions for Footwear Design and Pattern Engineering: 2D and 3D Perspectives” is a step in this direction.

The manual is extremely intensive and focused. It dwells on every aspect of footwear – from styling to Computer Aided Design of footwear styles and is comprehensive, thus catering to both freshers as well as experienced people from the industry. Students would get a deeper understanding of Footwear Designing including the basic styles and sizing systems. This would enable designers to be more creative with product range building and rule the market with competitive designs.

The CAD manual would enable designers and pattern engineers explore the gamut of software options and with this knowledge help them increase productivity, design flexibility and accuracy of pattern making and engineering.

Creating style lines both manually and by digitizing them off a 3D last is covered in this manual which would enable pattern creation and engineering of the style for production.

The various modules covered are:

Digitizing a 3D Last - where the process used to digitizing a physical shoe last into the system is covered and introduces the usage of a Microscribe 3D digitizer to digitize the last bottom and upper.

Working with a 3D Last – where the modification features that allow the creation of a fully customized last is covered. It also covers the process of creating a production standard 2D flattening of a 3D last as well as 3D last grading.

Style Creation – where Creating style lines both manually and by digitizing them off a 3D last is covered. This will enable pattern creation and engineering of the style for production.
Deriving a Mean Form and pattern-cutting of basic shoe styles – where the process of deriving the mean form (2D representation of a model last) from a last is covered. It forms the foundation of pattern making.

Product Range Building System – where the stages the product goes through right from conceptualization to the final production is covered.

Digitizing a Standard – where all functions required to digitize a 2D standard and style lines are introduced. This will enable one to pattern engineer styles for production.

Style Line Modifications – where all the basic modification tools are covered, enabling effective modifications to enhance style lines, create new style lines and manipulate them.

Pattern Creation – where the Basic functions used to create a set of Net Patterns are introduced. The patterns can later be used for design and engineering purposes.

Pattern Engineering – where the entire basic pattern engineering functions needed to prepare a style for production are introduced. This includes adding allowances, details, markers, text to arcs, notches.

Grading – where the scaling of a model size pattern to different sizes based on a particular sizing system is demonstrated. This module covers grading patterns, holding patterns and grouping grading.

Style Transfer and Plotting/Cutting – where the Style Transfer function is introduced which enables the transfer of a complete style from one standard to another. The module also covers transfer of a style, creation of a cut file and interfacing the cutter.

The objective of preparing this manual is to train the next generation of designers and provide them with the essential knowledge and technical skills needed for the workplace in all aspects of design, engineering and product data management. It is our firm belief that automated CAD-CAM Solutions would give the cutting edge to footwear manufacturing units to develop quality products with quicker turnaround times even for complex designs.

The Manual has been presented in a very easy to use manner with abundant graphic illustrations and plentiful use of icons which would help one to navigate through the various menu options in a very intuitive manner.

We are very grateful to M/s Torielli S.p.a. for granting permission to use material from the Shoemaster documentation.

We are confident that this manual would be very useful for students, aspiring designers as well as experienced designers and pattern engineers work creatively with increased accuracy and better productivity.

August 2016
Chennai

Dr. B Chandrasekaran
Director
EDITORIAL CREDITS

CSIR-CLRI SHOE & PRODUCT DESIGN CENTRE

Gautham Gopalakrishna
Md Sadiq
Bhabendra Nath Das
D Suresh Kumar

Design Support

K Dayalan
K Jagadesh

TORIELLI (India) Pvt. Ltd.

KV Sathish