Designing and Turning *The Continuous Profile*

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Preface

This article was originally published as the "Featured Article" in the June 2014 edition of the woodturningonline.com newsletter. As a result, craftsmen around the world have been creating their own Continuous Profiles of family members and friends. Following is the introduction to the article found in the newsletter.

Featured Turning Article

Designing and Turning The Continuous Profile
by David Eldredge

The mystique of the human profile has been documented throughout history and explored in most all types of art. David Eldredge has been exploring it using woodturning as the medium.

The concept of The Continuous Profile is a 3-dimensional rendering that employs a process where the frontal portion of the human head in profile is used as a pattern for turning on a wood lathe. The resulting object is an abstraction of the subject's facial profile that is identical throughout the entire 360 degrees when the object is rotated on the vertical axis.

David has just written a new article describing his learnings and we offer it here as a way for you to start exploring this fanscinating art concept!

Read David's artilcle, by clicking the following link:
Designing and Turning The Continuous Profile

And if you'd like to pursue this concept further, David offers an inexpensive electronic book which goes into significantly more detail and uses both animations and other multi-media widgets to help you fully understand this unique art abstraction.

More Woodturning Online Turning Articles

Submit a woodturning article

If you'd like to write an article (or project) on woodturning, we'd be happy to help in any way possible, once again, just let us know at the following link:

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Background

The human head in profile has been part of the art world for centuries in paintings, murals, and other forms. Two-dimensional "Silhouettes" of the head in profile were widespread during the Revolutionary period in America, as evident in wall hangings in Thomas Jefferson's estate, Monticello. Silhouettes were again popular in the 1920s and 1930s, where the head in profile was cut out of black paper and mounted on a white background. To the present day, silhouettes are still created and displayed as a form of art.

An Italian artist, Renato Bertelli (1900 – 1974) created *Profilo Continuo del Duce* (Continuous profile of Mussolini) in Florence in 1933. Two quite different versions of Bertelli's work exist in museums in Miami and London. Made of Terra Cotta, the profiles are approximately the size of the human head.


Profilo Continuo del Duce

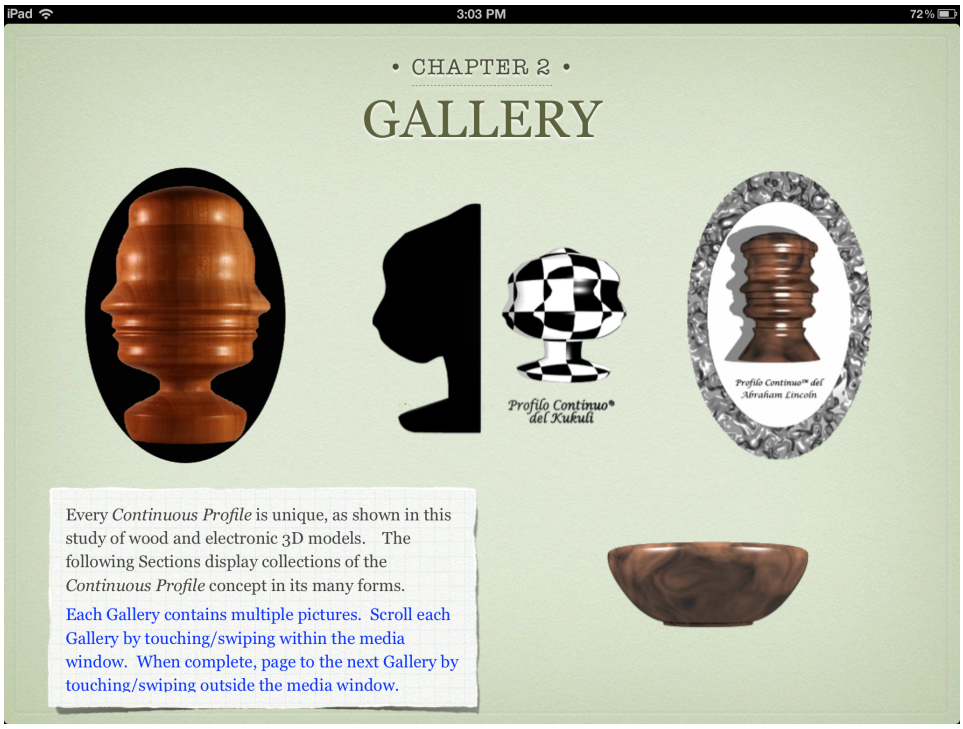
The concept of ***The Continuous Profile*** is a 3-dimensional rendering that employs a process where the frontal portion of the human head in profile is used as a pattern for turning on a wood lathe. The resulting object is an abstraction of the subject's facial profile that is identical throughout the entire 360 degrees when the object is rotated on the vertical axis. Similar to snowflakes and fingerprints, it is believed that no two human profiles are exactly the same; therefore all Continuous Profiles are unique, yielding infinite variability. The primary use for the resulting Continuous Profile is as an abstract art form in wood, terra cotta, plastic, or other material, similar in concept to the famous busts of Plato, Beethoven, Bach, and Brahms. *The Continuous Profile* concept might also be used as an abstracted personalization of everyday objects such as bed posts, newel posts, gearshift knobs, lamp bases. The process of turning *The Continuous Profile* on the wood lathe yields an interesting, if not somewhat disorienting abstraction of the human face. It is often challenging for the viewer to resolve the resulting object back to the source, but – much like Magic Eye 3D computer images – once the image is recognized a satisfying "Aha!" moment occurs for the viewer.


Profilo Continuo™ del Lara (in Cherry)

In creating the original prototypes, I decided to use a duplicator attached to the midi-lathe to transfer as much of the nuanced facial detail as possible. The prototypes were limited to the constraints of the midi-lathe and available wood blanks (4" x 4" x 6"), so the prototypes are not intended to simulate the actual size of the human head. The dictum: "It is what it is!" applied during prototyping, meaning that the nose or other facial features were not exaggerated and beards and hairstyles remained as the camera saw them. I did not intentionally set out to make caricatures; the abstraction of the turning process was enough. Different wood and stain combinations were

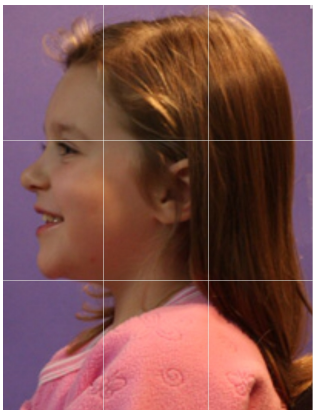
used, including poplar, cherry, walnut, and maple. Wood turners will likely opt to turn their Continuous Profiles freeform and will be able to capture the nuanced detail of the facial profile.

The Gallery found in *The Continuous Profile* eBook displays all the prototypes as well as 3D electronic renderings of US Presidents and other famous people.



Designing *The Continuous Profile*

Designing a new Continuous Profile is simply a matter of extracting the salient features of the human head in profile from a photo or scanned image. Minor editing of the image, including alignment and resizing may be required to establish the final tool path. The capture process starts with a digital image of the object using a camera capable of creating industry standard file formats such as JPEG. Following are considerations when taking the digital image of the facial profile used to create the 3D rendering of *The Continuous Profile*. Note that the entire image capture step is easy and should not take more than several minutes. You will need:



- Subject (Person) to be photographed. Family pets may also be candidates, but good luck getting Muffy to pose.
- Digital camera or cell phone camera. Flash turned off to avoid shadows.
- Background (wall or door) of uniform color (preferably bright white) that is different from the person being photographed.
- Working knowledge of Photo editing software, such as PhotoShop to extract and resize the 2D profile

- Printer to create a pattern

Considerations for capturing the 2D image of the person's profile include:

1. The Subject should not wear eyeglasses or jewelry that extends beyond their natural profile
2. Hair can cause distortions in the resulting 3D rendering and should be combed back unless it is normally styled close to the head. Try to avoid wispy hair extending beyond the front portion of the facial profile
3. Mouth can be either gently closed or opened, as in a smile. Try to avoid tightly closing lips, which will lose detail of the profile
4. If possible, clothing should not be high on the neck since it may be picked up as part of the profile.
5. The camera should be at least 5 feet away from the subject and the subject should be at least 2 feet from the background. Make sure there are no shadows cast on the background from either the subject or other source
6. The subject's head should be perpendicular to the camera to capture as much profile information as possible

To create the design pattern, transfer the electronic image to a personal computer and open the file in your favorite photo editor application. Resize the image to scale it to the proper width and height to produce a Continuous Profile of the desired dimension. Although the original prototypes were 4" diameter, you should be able to scale your Continuous Profile to a larger size depending on the capacity of the lathe and availability of turning stock. Using the photo editor, electronically "cut" the image in half, saving the facial portion, which will be used to create the pattern. Using the "Free Rotate" feature found in most photo editors, you should adjust the profile orientation so that it is vertical.

In order to complete the pattern, a base must be added to the bottom of the profile. This will take some creative use of your photo editor to design a base that fits with the look and feel of the Continuous Profile. You may also need to adapt the neckline in order to integrate the base. If necessary, resize the pattern to conform to the desired dimensions of the finished Continuous Profile. Since my turning square is 4" x 4", I set the width to 2", which is the radius of the finished turning at the widest point. The photo editor should scale the height to keep the pattern proportional.

Print the 2D image on regular paper stock and cut a rectangular section around the pattern. Creating the design pattern to scale with all the nuanced detail of the facial profile will provide you with an excellent means to free-turn your Continuous Profile.

Turning *The Continuous Profile*

The wood chosen for your Continuous Profile is very much a personal decision. I decided to try different woods, including cherry, maple, walnut and poplar. Turning stock was available in 4" squares, which was a good size for my midi-lathe. My next approach will be to apply Segmented Turning techniques by gluing up stock using smaller turning squares of differing species of wood. The effect of doing this may prove useful to provide a line of demarcation between the segments, which will help the eye resolve the abstraction of the turned Continuous Profile. Depending on the size of your lathe, larger turning stock may be desired; just remember to scale your design to meet the final dimensions desired.

I mounted the turning square on the lathe using a 3" faceplate. The nature of the Continuous Profile is that there is both spindle tuning and face turning involved, so mounting between centers proved to be impractical. A plywood spacer disc is glued to the turning stock and the faceplate is screwed into place. Rounding the blank can be done with standard lathe tools to the diameter of the finished object at it's widest point (usually the nose). Using standard "free-form" turning techniques, the rounded blank is rough cut to the contours of the design. When the rough cutting is complete, fine detail work is performed using standard wood lathe cutting tools. Sanding of *The Continuous Profile* on the lathe is done in multiple steps, starting with coarse sandpaper and ending with very fine grit sandpaper. *The Continuous Profile* is finished on the spinning lathe using two steps where different bars of *HUT Perfect Pen Polish (P.P.P.)* are applied and buffed to a satin sheen.

Computer Rendering

Computer rendering of a Continuous Profile allows the craftsman to verify the design prior to turning a block of wood on the lathe. The 3D animation software used to create the electronic rendering requires that the digital image (raster format) be converted to a vector format prior to processing, using an application such as Adobe Illustrator. The resulting animations have been used as virtual trading cards shared on the Internet and as unique pictures on FaceBook. The eBook *the Continuous Profile*

Profilo Continuo del Shea
(Computer Rendering)

provides tips and techniques for creating electronic renderings of your design prior to committing to the lathe.

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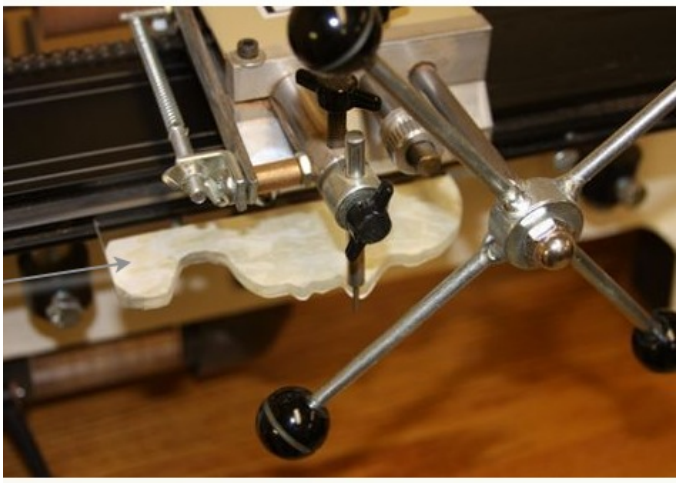
Note: The Craft eBook *The Continuous Profile* is not an instruction manual on wood turning and assumes that the craftsman is skilled in the use of a wood lathe and will apply his/her best practices for safely creating their own Continuous Profiles of family and friends. A skilled wood turner will likely opt to turn a Continuous Profile freeform and will be able to capture the nuanced detail of the facial profile. The book describes the turning process I used during prototyping using a pattern mounted in a replicator attached to the midi-lathe. This allowed me to cut safely to the final tool path without the worry of cutting too much or too little. Each piece was completed by removing the replicator from the lathe and performing final freeform touch-up prior to copious sanding and finishing.

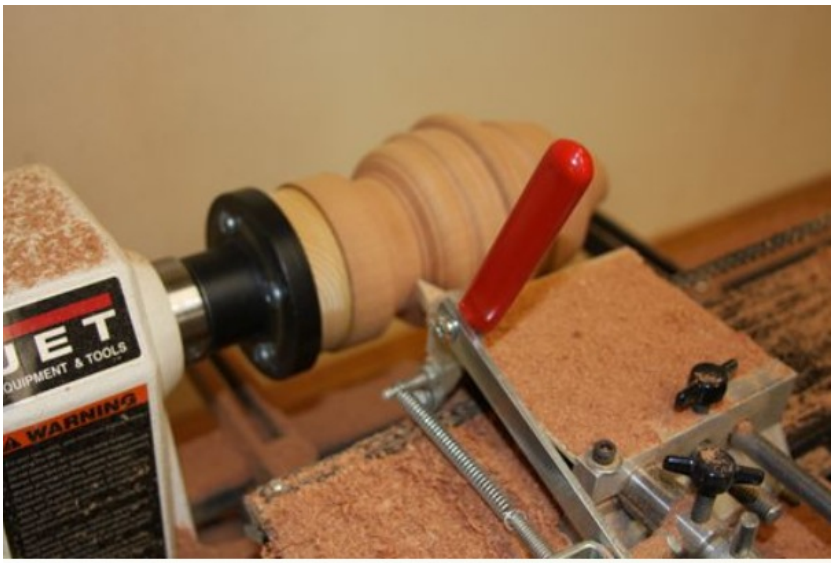
The eBook provides an excellent foundation for capturing the design and creating the finished product and explores how to create 3D renderings of your work, iterating on the design prior to committing to that expensive piece of wood.

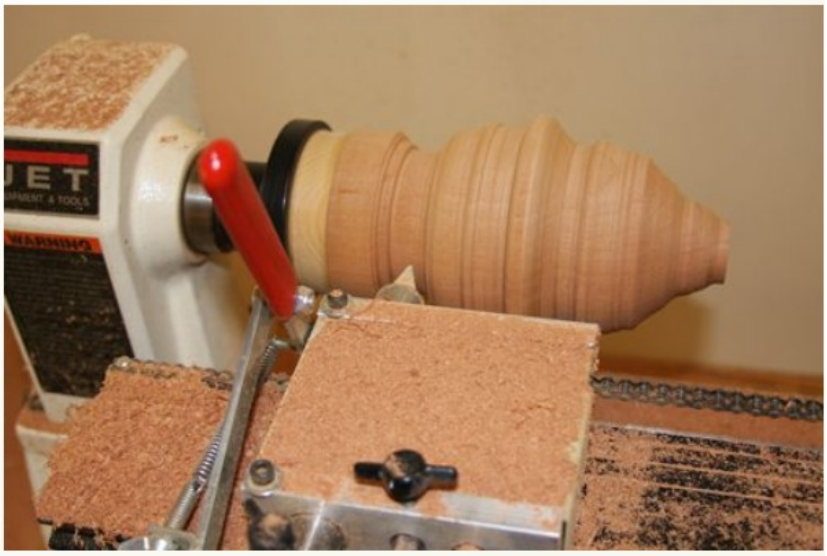
Using a Replicator to Turn a Continuous Profile

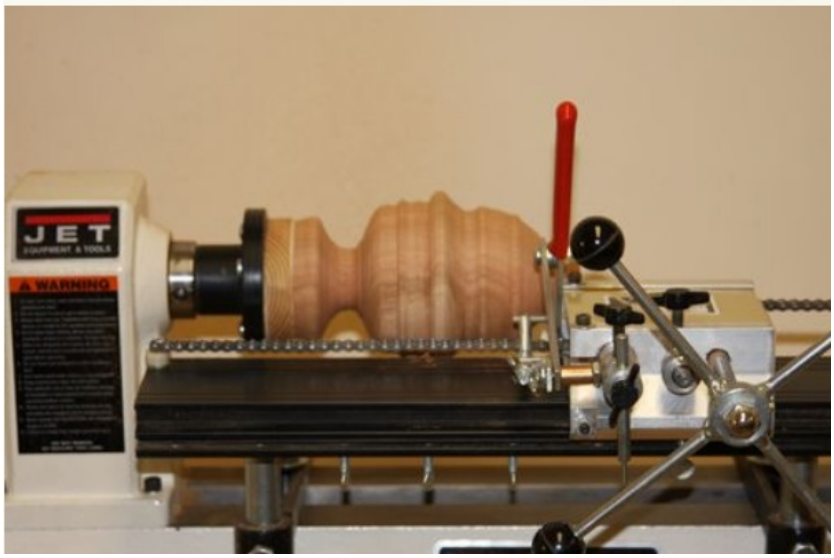
As stated above, I mounted the tuning square on the lathe using a 3" faceplate. The nature of the Continuous Profile is that there is both spindle tuning and face turning involved, so mounting between centers proved to be impractical. A plywood spacer disc is glued to the turning stock and the faceplate is screwed into place. Rounding the blank can be done with standard lathe tools, or by taking multiple passes using the duplicator to the diameter of the finished object at it's widest point (usually the nose). For opting to use a replicator:

- The resulting pattern is inserted in the duplicator, which is mounted in the midi-lathe.
- A previously rounded turning blank mounted on a faceplate on the mini-lathe is worked to the contours of the pattern using multiple passes of the cutting tool following the pattern affixed to the duplicator.
- When the rough cutting is complete using the replicator, fine detail work is performed manually using standard wood lathe cutting tools.
- Sanding of *The Continuous Profile* on the lathe is done in multiple steps, starting with coarse sandpaper and ending with very fine grit sandpaper.
- *The Continuous Profile* is finished on the spinning lathe using two steps where different bars of *HUT Perfect Pen Polish (P.P.P.)* are applied and buffed to a satin sheen.









Additional Information and Resources

The Continuous Profile LLC was created in June 2008 and the Articles of Organization are registered in Maryland. The company designs, creates 3D electronic renderings (modeling), and turns the customized artwork for either stand-alone display or integration into furniture. The processes used to design and create a Continuous Profile, both electronic and wood, are now documented in this Craft eBook that also generalizes the processes so that a craft person can use the same techniques for modeling and turning useful objects found in the home. The eBook is targeted to the novice to intermediate wood turner, although advanced craftsmen will benefit from the sections on design and rendering the 3D model. Wood turners will enjoy creating their own Continuous Profiles of family, friends and pets. ***The Continuous Profile*** is now available for sale on iBooks stores worldwide for reading on an iPad in Landscape orientation and all Mac computers with OS X Mavericks installed. The eBook takes advantage of multi-touch interactions by the reader using 3D and other multi-media widgets.

The Continuous Profile Craft eBook is available on 51 iBooks stores worldwide and was recently recognized for excellence in digital presentation, receiving the Benjamin Franklin Digital Award - Silver. Featured as a *New and Hot* product on woodturningonline.com, the concept of turning this unique art abstraction of family and friends is now embraced by wood turners worldwide as a challenging and rewarding expression of their craft.

Author: David Eldredge received a Bachelor of Science degree in Wood Engineering from SUNY College of Environmental Science and Forestry at Syracuse University. His professional career at IBM focused on software development, including Artificial Intelligence applications and the ImagePlus product line. Mr. Eldredge founded The Continuous Profile LLC to design and create art objects using the personal computer for design / electronic rendering and the wood lathe for turning the finished product. His eBook *The Continuous Profile* documents the processes he uses to design and create a uniquely personalized art abstraction.

For more information,
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