



3D Printing With NCATP

Utilizing Current Technology to Enhance Future
Possibilities



What is 3D Printing?



An additive manufacturing process where the filament is layered into a 3D object or device

Creates three-dimensional (3D) objects utilizing computer-aided designs (CAD)

Utilizes various filaments and software to create the desired 3D object

Different Kinds of 3D Printers

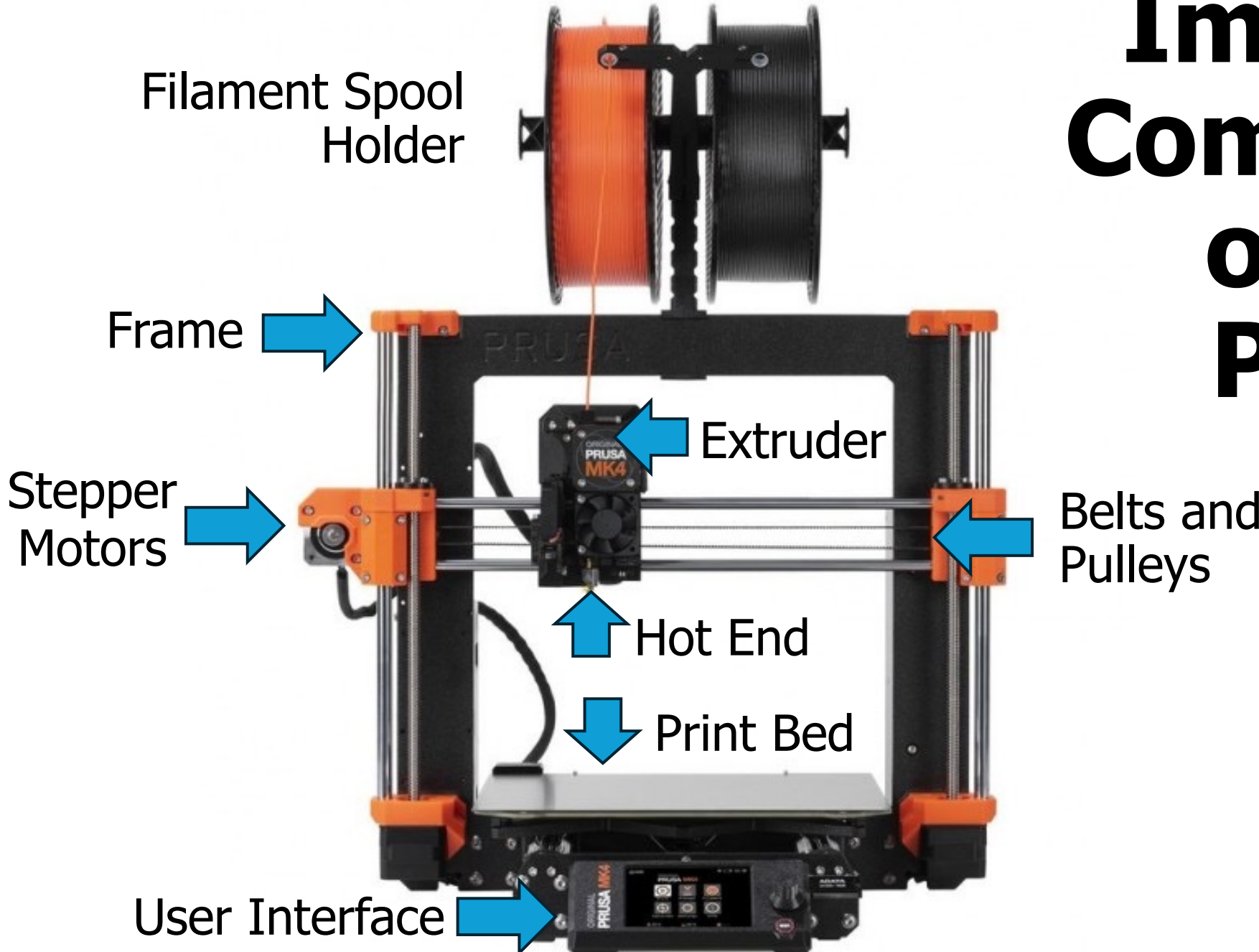


- **FDM – Fused Deposition Modeling printers are the most common 3D printers; use various filaments**
- SLA – Stereolithography printers began the 3D printing craze; use resin to build solid layers
- SLS – Selective Laser Sintering printers use lasers to fuse powder into solid layers
- EBM – Electron Beam Melting printers melt and fuse metallic powder into solid layers

Different Kinds of Filament

- **PLA – the most used filament for hobbyists and beginners**
- ABS – stronger and more durable than PLA
- **PETG – combines PLA's ease of use with the durability of ABS**
- TPU – more flexible and pliable by design.
- Nylon – allows for flexibility, yet the material is strong and dependable

Important Components of a 3D Printer



NCATP 3D Printers

- **UltiMaker S5 Pro Bundle**
 - Resides in the Raleigh and Charlotte NCATP Centers; used to make assistive line readers
- Creality Ender-3 Neo
 - Resides in the Sanford NCATP Center
- Prusa i3 MK3S+
 - Resides in the Sanford NCATP Center

UltiMaker S5

The UltiMaker S5 Pro Bundle allows for professional-grade 3D printing, with seamless transitions between filaments, making the effort and process of creating detailed 3D devices for those who are beginning their 3D printing journey by providing top-of-the-line technology and efficiency

Ender-3 Neo

The Creality Ender-3 Neo 3D printer is a budget-friendly and reliable option for 3D printing enthusiasts seeking quality and versatility.

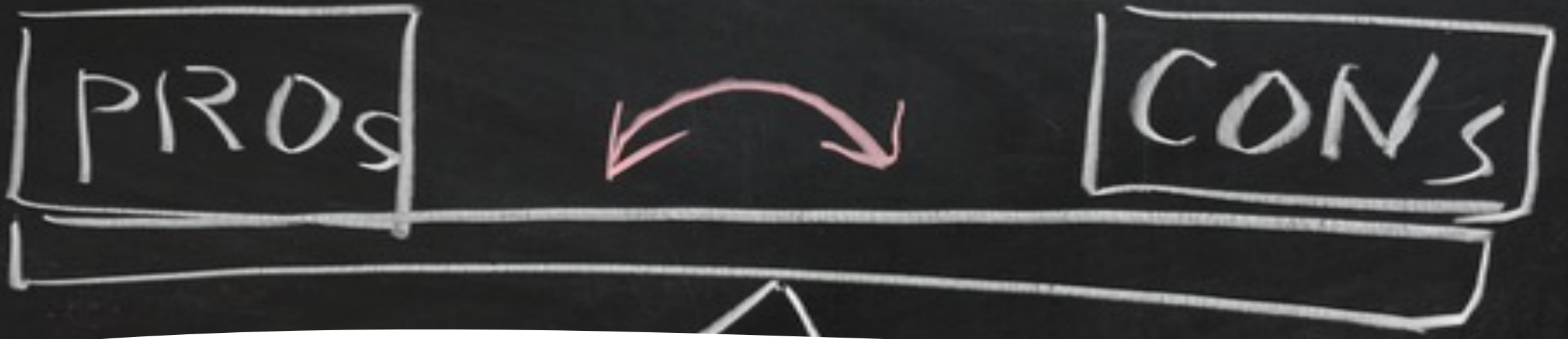
Prusa i3 MK3S+

Many of the features that come standard with this model allow for high-quality performance and efficiency at your fingertips, and this open-source 3D printer can be upgraded or modified to meet whatever printing desires the end-user possesses.

Assistive Line Readers

- Adult and pediatric/low-vision assistive line readers with different-sized “viewing windows” to meet various reading font sizes
- Low-tech AT devices that assist in managing symptoms stemming from ADHD and Dyslexia; help improve reading skills and performance
- Created primarily using UltiMaker S5 Pro Bundle printers allowing for dual extrusion





Pros

- Customization of 3D prints
- Cost-effectiveness of printing devices and tools
- Accessibility of 3D printer
- Fast turnaround of prototypes

Cons

- Initial costs of equipment and maintenance
- Limitations and reliability of some 3D printers
- Limitations of materials used in 3D printing
- Learning curve in understanding the specifics of 3D printing

😊 Thank You! 😊

- NCATP thanks you for participating in this year's NC AT Expo!
- We hope to continue creating AT devices that can assist ALL members of our local counties and communities.
- We look forward to creating a repository of AT devices that can be accessed digitally, making it easier to make requests for device creation across our many NCATP centers statewide.

Resources

- Ashtari, H. (2022, October 4). *How a 3D printer works and what it is used for*. What Is 3D Printing? Working, Software, and Applications. <https://www.spiceworks.com/tech/devops/articles/what-is-3d-printing/>
- Shahrubudin, N., Lee, T. C., & Ramlan, R. J. P. M. (2019). An overview on 3D printing technology: Technological, materials, and applications. *Procedia manufacturing*, 35, 1286-1296.
- Xometry. (2022, August 23). *10 3D printing machine parts and their functions*. 10 3D Printing Machine Parts and Their Functions. <https://www.xometry.com/resources/3d-printing/3d-printer-parts/>