The argumentation Package

Lars Bengel
lars.bengel@fernuni-hagen.de

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1 Example

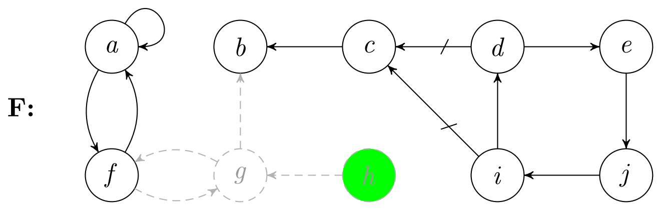


Figure 1: An exemplary AF created with the argumentation package.

```
\usepackage{argumentation}
\begin{figure}[ht]
    \centering
    \begin{af}
        \argument{args1}{a}
        \argument[right=of args1]{args2}{b}
        \argument[right=of args2]{args3}{c}
        \argument[right=of args3]{args4}{d}
        \argument[right=of args4]{args5}{e}
        \argument[below=of args1]{args6}{f}
        \argument[inactive,right=of args6]{args7}{g}
        \argument[inactive,argin,right=of args7]{args8}{h}
        \argument[right=of args8]{args9}{i}
        \argument[right=of args9]{args10}{j}

        \afname[left of=args1,yshift=-0.8cm,xshift=-0.2cm]{cap}{\textbf{F:}}

        \selfattack{args1}
        \dualattack{args1}{args6}
        \dualattack[inactive]{args6}{args7}

        \attack[inactive]{args8}{args7}
        \attack[inactive]{args7}{args2}
        \attack{args3}{args2}
        \attack{args4}{args5}
        \attack{args5}{args10}
        \attack{args10}{args9}
        \attack{args9}{args4}

        \support{args4}{args3}
        \support{args9}{args3}
    \end{af}
    \caption{An exemplary AF created with the \textsf{argumentation} package.}
    \label{fig:example}
\end{figure}
```

2 Documentation for Version 1.1 [2023/11/05]

In the following, we provide an overview over the functionality of the argumentation package.

2.1 Package Options

The argumentation package can be imported via the command
`\usepackage{argumentation}`

Alternatively, one can also adjust the appearance by providing some package options via
`\usepackage[⟨options⟩]{argumentation}`

The package provides the following *optional* options to customize the look of the argumentation frameworks.

namestyle	Customizes the font of the argument names.
argumentstyle	Customizes the appearance of the argument nodes.
attackstyle	Customizes the appearance of the attack edges.
supportstyle	Customizes the appearance of the support edges.

In the following, we list the available options for each of the style parameters.

`namestyle=`⟨*option*⟩

The namestyle parameter accepts three different options

italics	(default) The argument name is rendered in *italics*.
bold	The argument name is rendered in **bold**.
bolditalics	The argument name is rendered with ***both***.
normal	The argument name is rendered normally.

`argumentstyle=`⟨*option*⟩

The argumentstyle parameter accepts two options

standard	(default) Standard style for the argument nodes.
retro	Thicker outline and slightly larger nodes.

`attackstyle=`⟨*option*⟩

The attackstyle parameter accepts two options

standard	(default) Standard style for the attack arrow tips.
retro	Alternative style, arrow tip is larger and sharper.

`supportstyle=`*⟨option⟩*

The supportstyle parameter accepts three options

standard	(default) Standard style for the attack arrow tips.
dashed	Dashed arrow line, same tip.
double	Double arrow line and large flat tip.

2.2 Environments

The package provides two environments for creating abstract argumentation frameworks and bipolar argumentation frameworks in LaTeX-documents.

```
\begin{af}[⟨options⟩]
    ⟨environment content⟩
\end{af}
```

The argumentation package provides the af environment for creating abstract argumentation framework. The af environment extends the tikzpicture environment, meaning all Ti*k*Z commands can be used inside the af environment as well. Furthermore, all option for the tikzpicture environment can be provided as *options*. For instance, the option parameter `node distance`, which is set to `1cm` per default.

```
\begin{miniaf}[⟨options⟩]
    ⟨environment content⟩
\end{miniaf}
```

The miniaf environment can be used to create argumentation frameworks using less space. Especially useful for two-column layout documents. It provides essentially the same as the af environment, but with `node distance` set to `0.5cm` and for each node `minimum size=0.5cm`, `font=\small`.

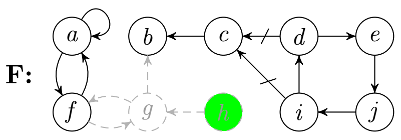


Figure 2: An exemplary Mini-AF created with the miniaf environment.

2.3 Arguments

Arguments can be created with the following command

`\argument{⟨id⟩}{⟨name⟩}`

⟨id⟩ is the identifier of the new argument

⟨name⟩ is the displayed name of the argument

To create an argument, you must provide a unique identifier and the name to be displayed in the picture. The *⟨id⟩* of an argument is then referred to when creating attacks as well as for the relative positioning of other arguments.

2.3.1 Relative Positioning

This package supports relative placement of the arguments via the Ti*k*Z-library `positioning`. The relative positioning information is provided as an optional parameter via

`\argument[⟨dir⟩=of ⟨arg_id⟩]{⟨id⟩}{⟨name⟩}`

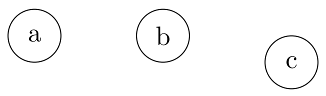
⟨dir⟩ has to be one of: *right*, *left*, *below* and *above*

⟨arg_id⟩ is the identifier of another argument

Additionally, you can adjust the horizontal/vertical position of an argument via the options `xshift=`*⟨v⟩* and `yshift=`*⟨v⟩*. The value *⟨v⟩* is the horizontal/vertical offset, e. g., `5pt`, `-3ex` or `0.2cm`.

Example 1

```
\begin{af}
    \argument{arg1}{a}
    \argument[right=of arg1]{arg2}{b}
    \argument[right=of arg2, yshift=-10pt]{arg3}{c}
\end{af}
```



2.3.2 Argument Styling

Furthermore, you can provide optional parameters to adjust the style of the argument node. For that you can use all Ti*k*Z-style options and additionally the following pre-defined style parameters:

inactive	The argument is displayed in grey and with a dotted outline.
argin	The argument is displayed with green background color.
argout	The argument is displayed with red background color.
argundec	The argument is displayed with cyan background color.

Some relevant Ti*k*Z style-parameters are

minimum size=0.75cm	the minimum size of the circle, to ensure consistent argument size.
draw=black	outline and text color of the argument.
fill=white	the background color of the argument.
font=large	the font size of the argument name.
inner sep=0	inner margins of the circle, set to 0 to optimize space.

2.4 Attacks

Attacks between two arguments can be created with the command

\attack{⟨*arg1*⟩}{⟨*arg2*⟩}

where ⟨*arg1*⟩ and ⟨*arg2*⟩ are the identifiers of two previously defined arguments.

2.4.1 Attack Styling

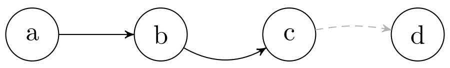
To customize an attack you can provide additional optional parameters:

inactive	The attack is displayed in grey and with a dotted line.
bend right	The attack arrow is bent to the right. Can additionally provide the angle, e. g., bend right=40.
bend left	The attack arrow is bent to the left. Can also provide an angle.

Furthermore, all tikz style parameters can be used here as well.

Example 2

```
\begin{af}
    \argument{arg1}{a}
    \argument[right=of arg1]{arg2}{b}
    \argument[right=of arg2]{arg3}{c}
    \argument[right=of arg3]{arg4}{d}
    \attack{arg1}{arg2}
    \attack[bend right]{arg2}{arg3}
    \attack[bend left=10,inactive]{arg3}{arg4}
\end{af}
```



Additionally, you can create a symmetric attack between two arguments with
`\dualattack{⟨arg1⟩}{⟨arg2⟩}`

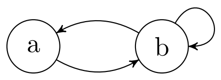
and a self-attack for an argument with
`\selfattack{⟨arg1⟩}`

For both commands, you can use the same optional parameters as for the `\attack` command.

Example 3

```
\begin{af}
    \argument{arg1}{a}
    \argument[right=of arg1]{arg2}{b}

    \selfattack{arg1}
    \dualattack{arg1}{arg2}
\end{af}
```



2.5 Supports

You can create a support relation between two arguments with the command

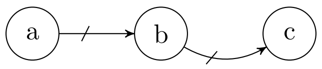
`\support{⟨arg1⟩}{⟨arg2⟩}`

where ⟨*arg1*⟩ and ⟨*arg2*⟩ are the identifiers of two previously defined arguments. The support arrow use the same tip as the attack arrows, but have a perpendicular mark to distinguish them from attacks. Supports can be customized in the same way as attacks.

Example 4

```
\begin{af}
    \argument{arg1}{a}
    \argument[right=of arg1]{arg2}{b}
    \argument[right=of arg2]{arg3}{c}

    \support{arg1}{arg2}
    \support[bend right]{arg2}{arg3}
\end{af}
```



2.6 Further Commands

If you want to display an identifier for your argumentation framework in the picture, you can use the command

`\afname{`⟨*id*⟩`}{`⟨*name*⟩`}`

where ⟨*id*⟩ is an identifier for the created node and ⟨*name*⟩ is the text displayed in the picture. Additionally, positioning information can be provided via the optional parameters.

Example 5

```
\begin{af}
    \argument{arg1}{a}
    \argument[right=of arg1]{arg2}{b}
    \afname[left=of arg1]{caption}{$F:$}

    \attack{arg1}{arg2}
\end{af}
```