

Konnexionen zwischen Trajekten von Zeichenklassen und Komplementklassen

1. In Toth (2025a) wurden die Schnittmengen für ZKL und $\mathfrak{T}(\text{ZKL})$ sowie CKL und $\mathfrak{T}(\text{CKL})$ getrennt behandelt, obwohl es weitere nicht leere Schnittmengen zwischen $\mathfrak{T}(\text{ZKL})$ und CKL gibt. Diese letzteren Schnittmengen werden im folgenden ermittelt, denn sie haben eine besondere Bedeutung, da die Vereinigung von ZKL und CKL ja jeweils einen Matrizenraum ergibt (vgl. Toth 2025b), d.h. die beiden Klassen sind diskret. Durch Trajektion ergeben sich allerdings Fälle verschiedener Zeichenkonnexionen, wo die Schnittmengen nichtleer sind.

2. Konnexionen zwischen $\mathfrak{T}(\text{ZKL})$ und CKL

1.

$$\text{ZKL} = (3.1, 2.1, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.1, 2.1, 1.1)$$

$$\text{CKL} = (2.2, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (2.2, 2.3, 2.3, 3.2, 3.3, 2.3)$$

2.

$$\text{ZKL} = (3.1, 2.1, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.1, 2.1, 1.2)$$

$$\text{CKL} = (1.1, 2.2, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 1.2, 2.2, 2.3, 2.3, 3.2, 3.3, 2.3)$$

3.

$$\text{ZKL} = (3.1, 2.1, 1.3)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.1, 2.1, 1.3)$$

$$\text{CKL} = (1.1, 2.2, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 1.2, 2.2, 2.3, 2.3, 3.2, 3.3, 2.3)$$

4.

$$\text{ZKL} = (3.1, 2.2, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.2, 2.1, 2.1)$$

$$\text{CKL} = (1.2, 2.1, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 2.1, 2.2, 1.3, 2.3, 3.2, 3.3, 2.3)$$

5.

$$\text{ZKL} = (3.1, 2.2, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.2, 2.1, 2.2)$$

$$\text{CKL} = (1.1, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 1.3, 2.3, 3.2, 3.3, 2.3)$$

6.

$$\text{ZKL} = (3.1, 2.2, 1.3)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.2, 2.1, 2.3)$$

$$\text{CKL} = (1.1, 1.2, 2.1, 2.3, 3.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 1.2, 1.2, 2.1, 2.2, 1.3, 2.3, 3.2, 3.3, 2.3)$$

7.

$$\text{ZKL} = (3.1, 2.3, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.3, 2.1, 3.1)$$

$$\text{CKL} = (1.2, 2.1, 2.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 2.1, 2.2, 1.2, 2.3, 2.3)$$

8.

$$\text{ZKL} = (3.1, 2.3, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 1.3, 2.1, 3.2)$$

$\emptyset$

$$\text{CKL} = (1.1, 2.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 1.2, 2.3, 2.3)$$

9.

$$\text{ZKL} = (3.1, 2.3, \textcolor{red}{1.3})$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, \textcolor{red}{1.3}, 2.1, 3.3)$$

$$\text{CKL} = (\textcolor{blue}{1.1}, \textcolor{blue}{1.2}, \textcolor{blue}{2.1}, \textcolor{blue}{2.2}, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (\textcolor{blue}{1.1}, \textcolor{blue}{1.2}, \textcolor{blue}{1.2}, \textcolor{blue}{2.1}, \textcolor{blue}{2.2}, \textcolor{blue}{1.2}, 2.3, 2.3)$$

10.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{1.1})$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{2.1}, \textcolor{red}{1.1})$$

$\emptyset$

$$\text{CKL} = (\textcolor{blue}{1.3}, 2.2, 3.1, \textcolor{blue}{3.3})$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 3.2, 2.3, 2.1, \textcolor{blue}{3.3}, \textcolor{blue}{1.3})$$

11.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{1.2})$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{2.1}, \textcolor{red}{1.2})$$

$\emptyset$

$$\text{CKL} = (\textcolor{blue}{1.1}, \textcolor{blue}{1.3}, 2.2, 3.1, \textcolor{blue}{3.3})$$

$$\mathfrak{T}(\text{CKL}) = (\textcolor{blue}{1.1}, \textcolor{blue}{1.3}, 1.2, 3.2, 2.3, 2.1, \textcolor{blue}{3.3}, \textcolor{blue}{1.3})$$

12.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{1.3})$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.1}, \textcolor{red}{2.1}, \textcolor{red}{1.3})$$

$\emptyset$

$$\text{CKL} = (1.1, 2.2, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (1.2, 1.2, 2.3, 2.3)$$

13.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 2.1, 2.1)$$

$$\text{CKL} = (\textcolor{blue}{1.2}, \textcolor{blue}{1.3}, 2.1, \textcolor{blue}{3.1}, \textcolor{blue}{3.3})$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 2.3, \textcolor{blue}{1.2}, \textcolor{blue}{3.1}, 2.3, 1.1, \textcolor{blue}{3.3}, \textcolor{blue}{1.3})$$

14.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 2.1, \textcolor{red}{2.2})$$

$\emptyset$

$$\text{CKL} = (\textcolor{blue}{1.1}, \textcolor{blue}{1.3}, \textcolor{blue}{3.1}, \textcolor{blue}{3.3})$$

$$\mathfrak{T}(\text{CKL}) = (\textcolor{blue}{1.1}, \textcolor{blue}{1.3}, \textcolor{blue}{1.3}, \textcolor{blue}{3.1}, \textcolor{blue}{3.3}, \textcolor{blue}{1.3})$$

15.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 1.3)$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.2}, 2.1, 2.3)$$

$$\text{CKL} = (\textcolor{blue}{1.1}, \textcolor{blue}{1.2}, \textcolor{blue}{2.1}, 3.3)$$

$$\mathfrak{T}(\text{CKL}) = (\textcolor{blue}{1.1}, \textcolor{blue}{1.2}, \textcolor{blue}{1.2}, \textcolor{blue}{2.1}, 2.3, 1.3)$$

16.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.3}, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.3}, 2.1, 3.1)$$

$$\text{CKL} = (\textcolor{blue}{1.2}, \textcolor{blue}{1.3}, \textcolor{blue}{2.1}, \textcolor{blue}{2.2}, \textcolor{blue}{3.1}, \textcolor{blue}{3.3})$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 2.3, \textcolor{blue}{1.2}, \textcolor{blue}{3.1}, \textcolor{blue}{2.2}, \textcolor{blue}{1.2}, 2.3, \textcolor{blue}{2.1}, \textcolor{blue}{3.3}, \textcolor{blue}{1.3})$$

17.

$$\text{ZKL} = (\textcolor{red}{3.2}, \textcolor{red}{2.3}, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (\textcolor{red}{3.2}, \textcolor{red}{2.3}, 2.1, \textcolor{red}{3.2})$$

$\emptyset$

CKL = (1.1, 1.3, 2.2, 3.1, 3.3)

$\mathfrak{T}(\text{CKL}) = (1.1, 1.3, 1.2, 3.2, 2.3, 2.1, 3.3, 1.3)$

18.

ZKL = (3.2, 2.3, 1.3)

$\mathfrak{T}(\text{ZKL}) = (3.2, 2.3, 2.1, 3.3)$

CKL = (1.1, 1.2, 2.1, 2.2, 3.3)

$\mathfrak{T}(\text{CKL}) = (1.1, 1.2, 1.2, 2.1, 2.2, 1.2, 2.3, 2.3)$

19.

ZKL = (3.3, 2.1, 1.1)

$\mathfrak{T}(\text{ZKL}) = (3.2, 3.1, 2.1, 1.1)$

CKL = (1.3, 2.2, 2.3, 3.1, 3.2)

$\mathfrak{T}(\text{CKL}) = (1.2, 3.2, 2.2, 2.3, 2.3, 3.1, 3.3, 1.2)$

20.

ZKL = (3.3, 2.1, 1.2)

$\mathfrak{T}(\text{ZKL}) = (3.2, 3.1, 2.1, 1.2)$

CKL = (1.1, 1.3, 2.2, 2.3, 3.1, 3.2)

$\mathfrak{T}(\text{CKL}) = (1.1, 1.3, 1.2, 3.2, 2.2, 2.3, 2.3, 3.1, 3.3, 1.2)$

21.

ZKL = (3.3, 2.1, 1.3)

$\mathfrak{T}(\text{ZKL}) = (3.2, 3.1, 2.1, 1.3)$

CKL = (1.1, 2.2, 2.3, 3.2)

$\mathfrak{T}(\text{CKL}) = (1.2, 1.2, 2.2, 2.3, 2.3, 3.2)$

22.

$$\text{ZKL} = (3.3, 2.2, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 3.2, 2.1, 2.1)$$

$$\text{CKL} = (1.2, 1.3, 2.1, 2.3, 3.1, 3.2)$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 2.3, 1.2, 3.1, 2.2, 1.3, 2.3, 3.1, 3.3, 1.2)$$

23.

$$\text{ZKL} = (3.3, 2.2, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 3.2, 2.1, 2.2)$$

$$\text{CKL} = (1.1, 1.3, 2.3, 3.1, 3.2)$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 1.3, 1.2, 3.3, 2.3, 3.1, 3.3, 1.2)$$

24.

$$\text{ZKL} = (3.3, 2.2, 1.3)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 3.2, 2.1, 2.3)$$

$$\text{CKL} = (1.1, 1.2, 2.1, 2.3, 3.2)$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 1.2, 1.2, 2.1, 2.2, 1.3, 2.3, 3.2)$$

25.

$$\text{ZKL} = (3.3, 2.3, 1.1)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 3.3, 2.1, 3.1)$$

$$\text{CKL} = (1.2, 1.3, 2.1, 2.2, 3.1)$$

$$\mathfrak{T}(\text{CKL}) = (1.1, 2.3, 1.2, 3.1, 2.2, 1.2, 2.3, 2.1)$$

26.

$$\text{ZKL} = (3.3, 2.3, 1.2)$$

$$\mathfrak{T}(\text{ZKL}) = (3.2, 3.3, 2.1, 3.2)$$

$\emptyset$

CKL = (1.1, 1.3, 2.2, 3.1)

$\mathfrak{T}(\text{CKL}) = (1.1, 1.3, 1.2, 3.2, 2.3, 2.1)$

27.

ZKL = (3.3, 2.3, 1.3)

$\mathfrak{T}(\text{ZKL}) = (3.2, 3.3, 2.1, 3.3)$

CKL = (1.1, 1.2, 2.1, 2.2)

$\mathfrak{T}(\text{CKL}) = (1.1, 1.2, 1.2, 2.1, 2.2, 1.2)$

Literatur

Toth, Alfred, Trajektische Multisets. In: Eletronic Journal for Mathematical Semiotics, 2025a

Toth, Alfred, Duale und komplementäre Teilräume semiotischer Matrizen. In: Eletronic Journal for Mathematical Semiotics, 2025b

1.11.2025