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Working in the bitboard centric world to determine pawn related pattern set-wise.

Each pawn, member of the own [pawn attack set](#) is obviously defended by a pawn, thus likely not a winning capture target for opponent pieces (except pawns). If a defended pawn is [open](#), opponent rooks on [half-open](#) files bang one's head against a brick wall.

Defended

Again, it is advantageous to keep disjoint east-west attack sets for a unique 1:1 source-target relationship. On demand we can use the union or intersection on the fly. Note that attack direction is related to the target square. East attack is from south/north-west to north/south-east

white pawns	defended from west ->	defended from east <=
.
.
. . . . 1 1
. . . 1 . . 1 1 1 .
. . 1 1
.
.

```
U64 WPawnDefendedFromEast(U64 wpawns) {
    return wpawns & WPawnWestAttacks(wpawns);
}
```

To get the set of defenders on the fly, we use the intersection of white pawns with it's "black" attacks:

```
U64 wPawnDefendersFromEast(U64 wpawns) {
    return wpawns & bPawnEastAttacks(wpawns);
}
```

```
wPawnDefendersFromWest = wPawnDefendedFromWest >> 9;
wPawnDefendersFromEast = wPawnDefendedFromEast >> 7;
```

Defended defenders already are the inner pawns of a at least [triple-chain](#), the d5 pawn for instance:

white pawns

```
. . . . . . . .
. . . . . . . .
. . . . 1 . . .
. . . 1 . . 1 .
. . 1 . . . . 1
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defended
from west

```
. . . . . . . .
. . . . . . . .
. . . . 1 . . .
. . . 1 . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defended
from east

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . 1 .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

white pawns

```
. . . . . . . .
. . . . . . . .
. . . . 1 . . .
. . . 1 . . 1 .
. . 1 . . . . 1
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defenders
from west

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . 1 . . . .
. . 1 . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defenders
from east

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . 1 .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

white pawns

```
. . . . . . . .
. . . . . . . .
. . . . 1 . . .
. . . 1 . . 1 .
. . 1 . . . . 1
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defenders and
defended
from west

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . 1 . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

defenders and
defended
from east

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

Not Defended Defenders

Not defended defenders are the base of a [chain](#) - target of opponent attacks:

white pawns

```
. . . . . . . .
. . . . . . . .
. . . . 1 . . .
```

not defended
defenders
from west

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

not defended
defenders
from east

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

. . . 1 . . 1
. . 1 1	. . 1 1
.
.
.

Not Defending Defended

Defended pawns not defending other pawns are likely the peak of a [chain](#).

white pawns	not defending defended from west	not defending defended from east
.
.
. . . . 1 1
. . . 1 . . 1 1 .
. . 1 1
.
.
.

Forum Posts

- [pattern coding in bitboards](#) by [Pawel Koziol](#), [CCC](#), February 26, 2015 » [Pawn chain](#)

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