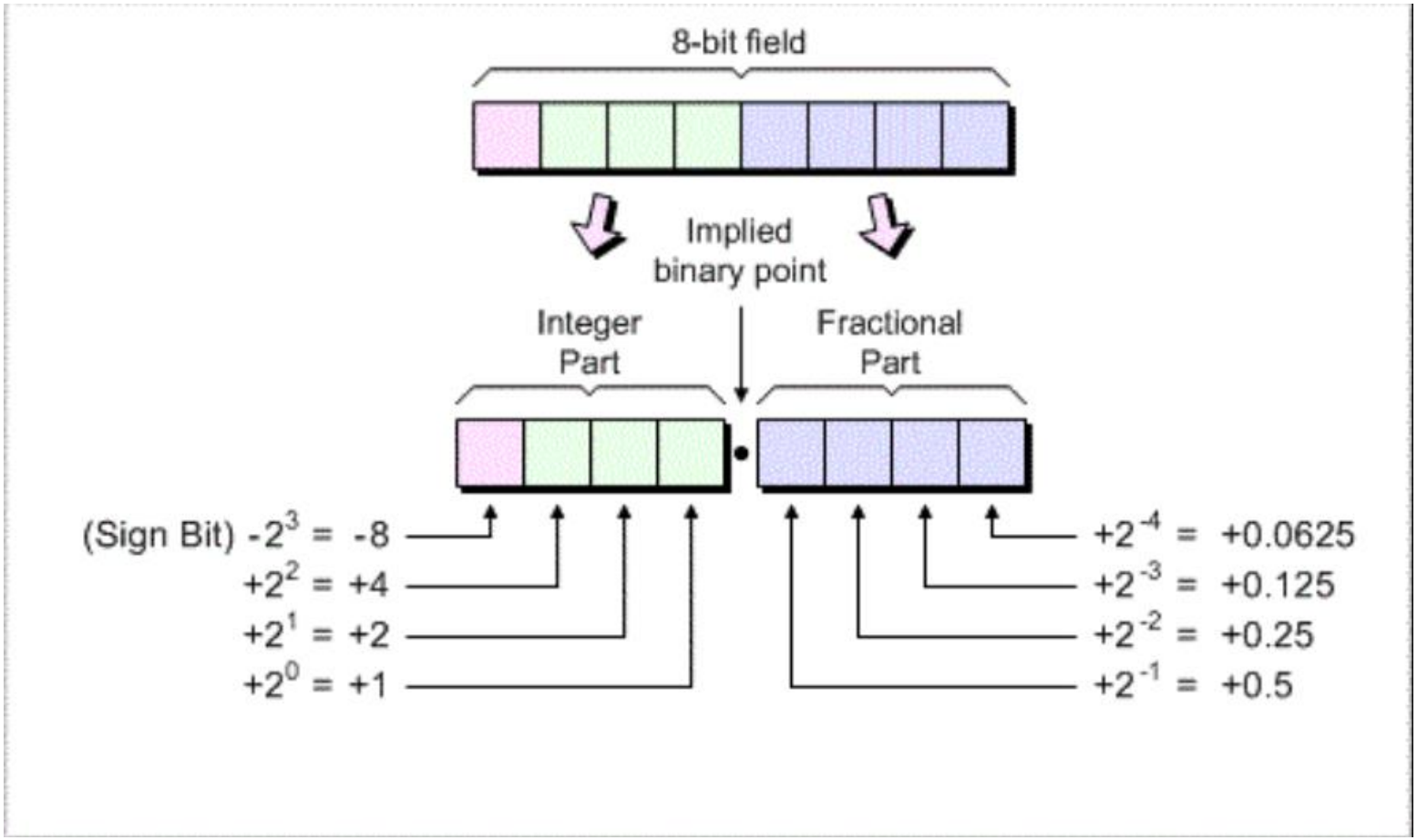
Arhitekture i algoritmi
DSP 2

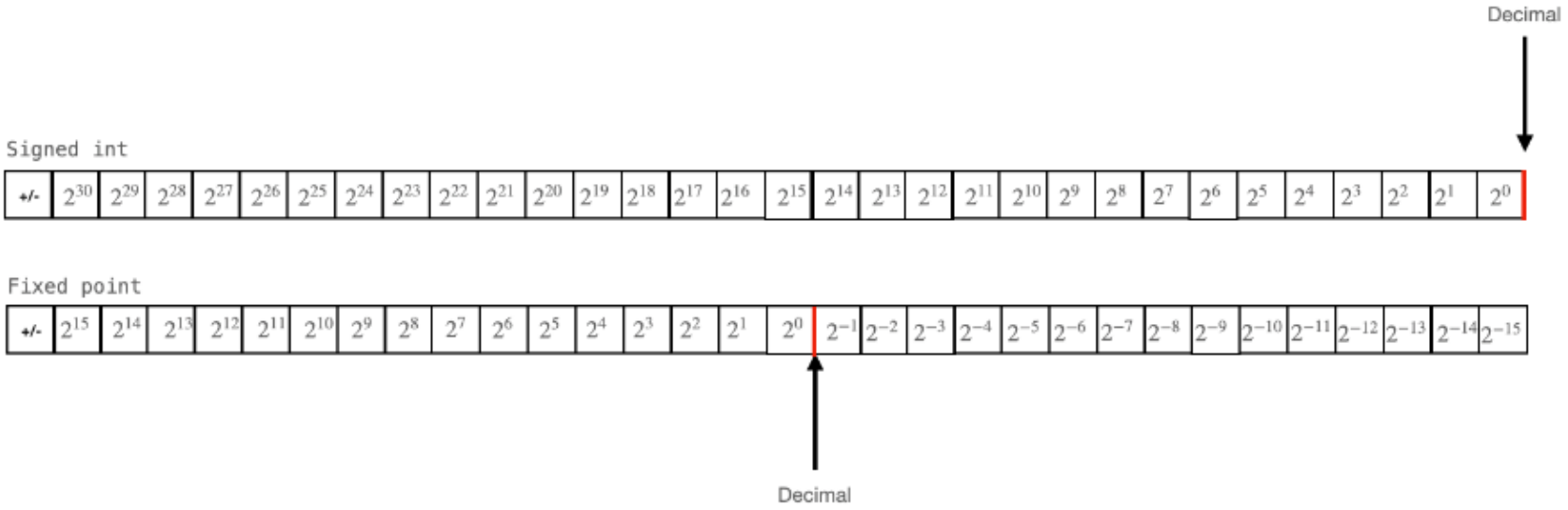
Auditorne vežbe AU-2[0]
Prikaz brojeva u fixed-point aritmetici

Odsek za računarsku tehniku i računarske komunikacije

Fixed-point aritmetika

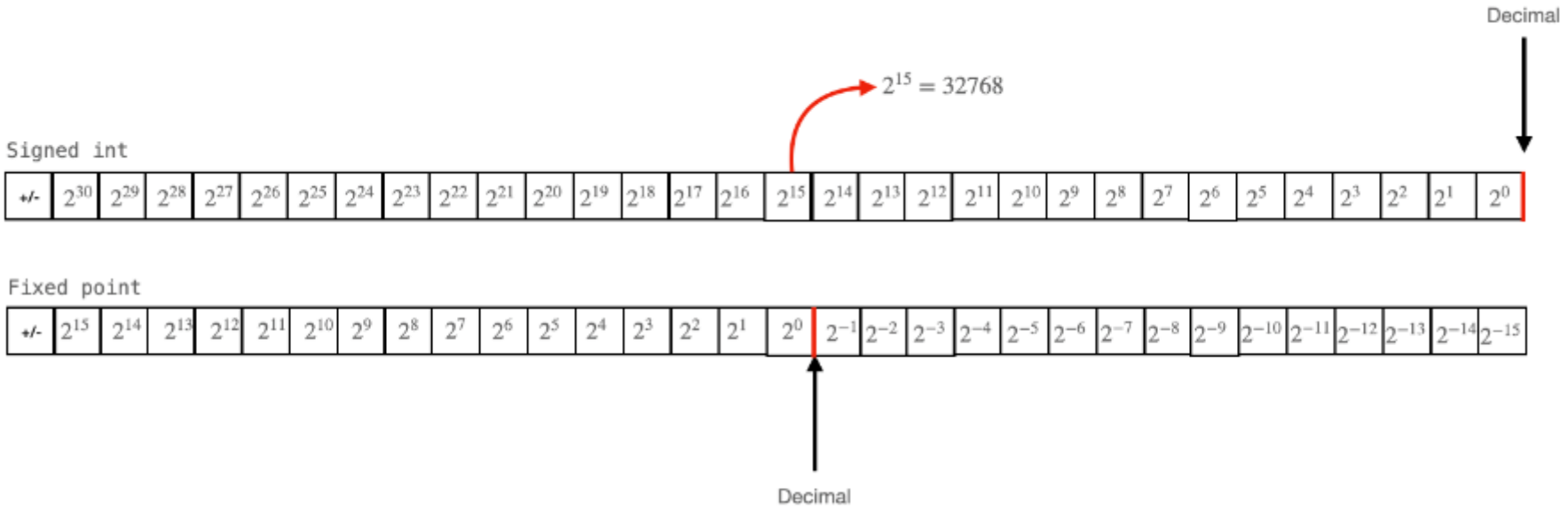


Int to fixed (fract)




```
#define int2fix(a) ((fix))((a) << 15))
#define fix2int(a) ((int))((a >> 15))
```

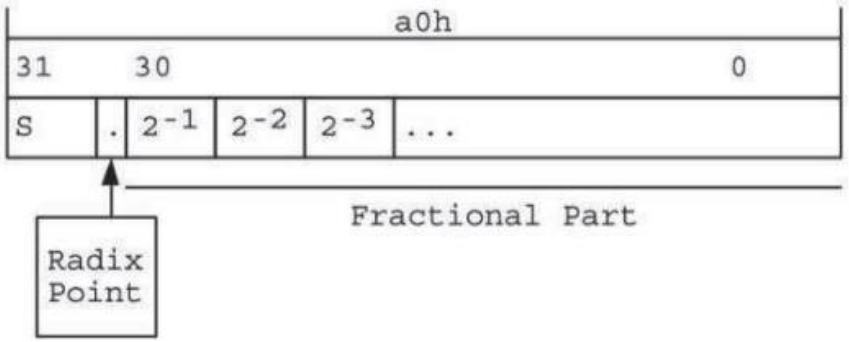
Float to fixed (fract)



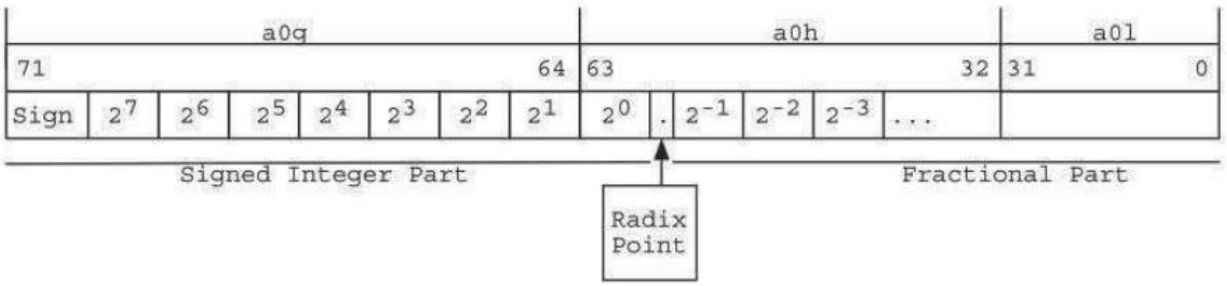

```
#define float2fix(a) ((fix))(a * 32768.0)
#define fix2float(a) ((float)(a) / 32768.0)
```

Više informacija o osnovama fixed point aritmetike:
https://vanhunteradams.com/FixedPoint/FixedPoint.html

CS497xx Fixed-Point



Slika 2.5 - 32-bitni prikaz brojeva sa nepokregnim zarezom



Slika 2.7 - 72-bitni prikaz brojeva sa nepokretnim zarezom

Integer artimetika na CS497?

- Kako sabrati 2 + 2 ako imamo opseg [-1, 1)?
- Tretirati fixed-point vrednosti kao intedžerske (32.0)!
- To je izvodljivo uvek (i sa drugim formatima), dokle god znamo šta radimo i kako tretiramo vrednosti
- Imati na umu da će DSP i dalje vršiti fixed-point aritmetiku!
- Množenje dva broja neće samo po sebi dati odgovarajući rezultat

```
a0 = x0 * x1
a0 = a0 >> 1
```

Aritmetika kroz vežbe

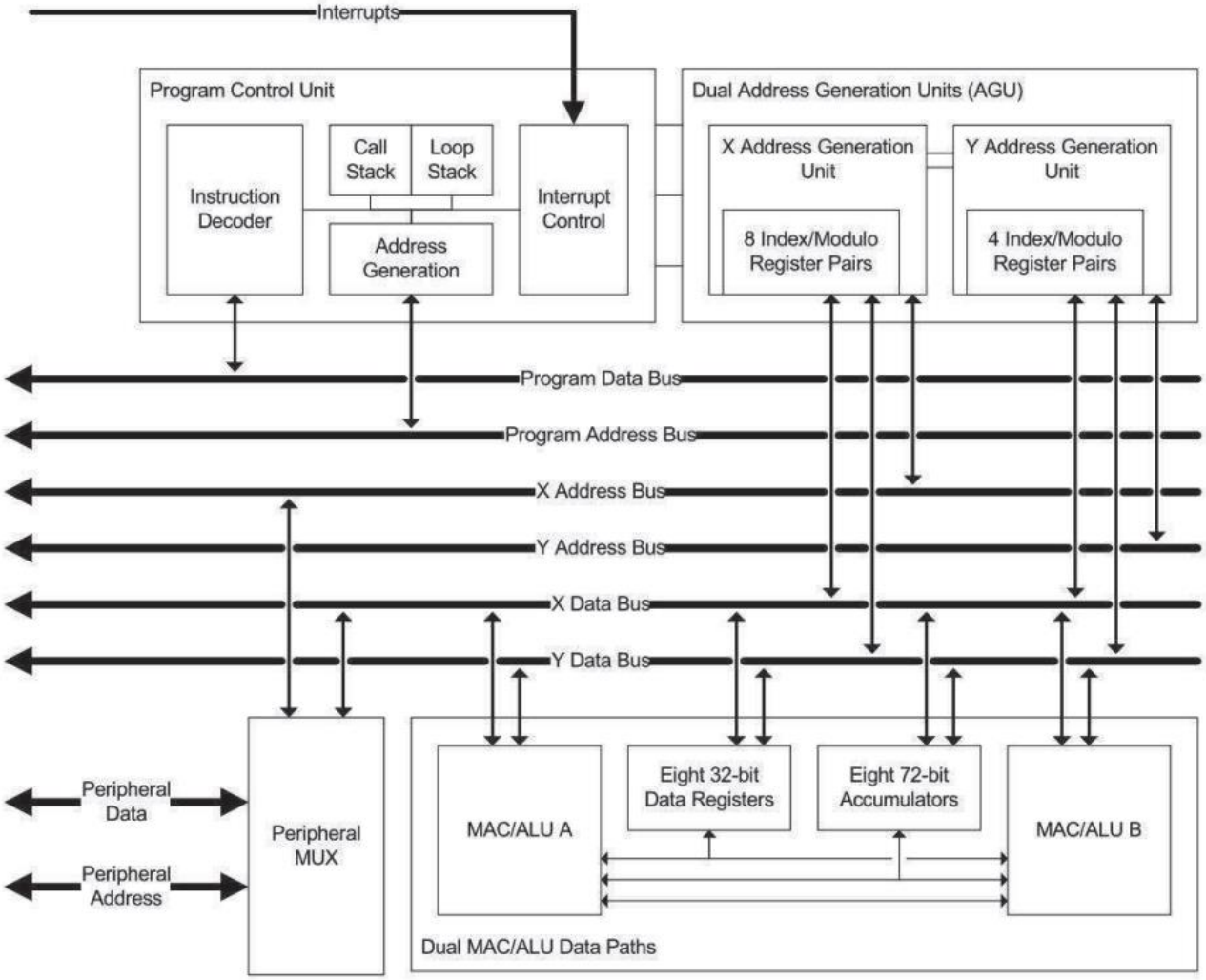
Broj dana/modula	Radno okruženje	Aritmetika
D1	CLIDE	Fixed-point native
D2	CLIDE	Fixed-point native
D3	CLIDE	Fixed-point native
D4	CLIDE	Fixed-point native
D5	Visual Studio	Floating-point native [fixed-point range!]
D6	Visual Studio	Fixed-point C++ emulation [fixed-point range!]
D7	Visual Studio	Fixed-point C++ emulation
D8	CLIDE	Fixed-point native (in C)
D9	CLIDE	Fixed-point native
D10	CLIDE	Fixed-point nativ

Arhitekture i algoritmi DSP 2

Auditorne vežbe AU-2[1]
Arhitektura DSP CS48x/CS497x

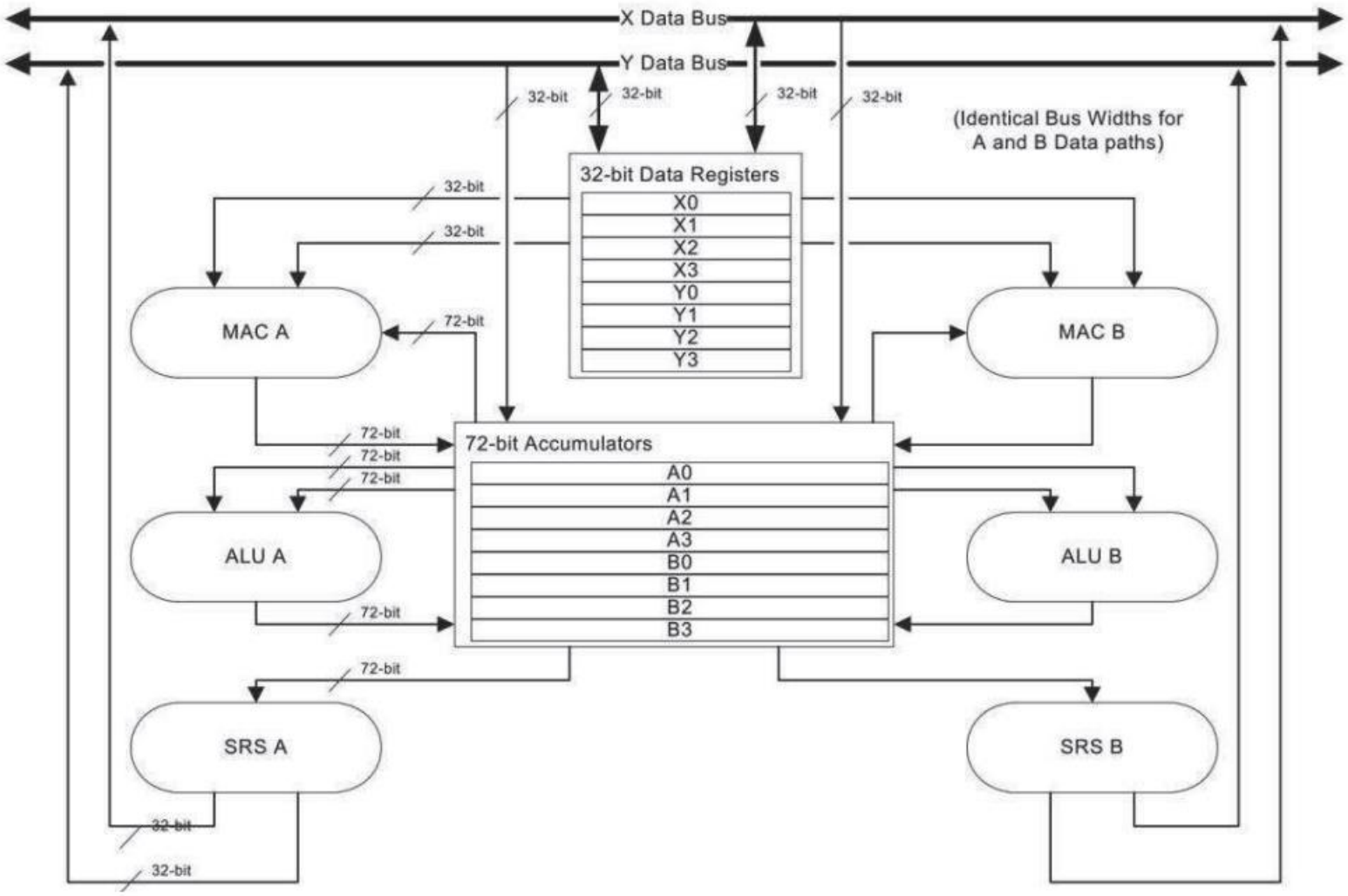
Odsek za računarsku tehniku i računarske komunikacije

Blok dijagram arhitekture



Slika 2.3 - Blok dijagram DSP arhitekture CS48x

Blok dijagram DSP jezgra



Slika 2.4 - Blok dijagram DSP jezgra CS48x

```
a0+=y0*x1;  b0+=y0*x0;  x0=xmem[i0]; i0-=1;  y0=ymem[i4]; i4+=1
```